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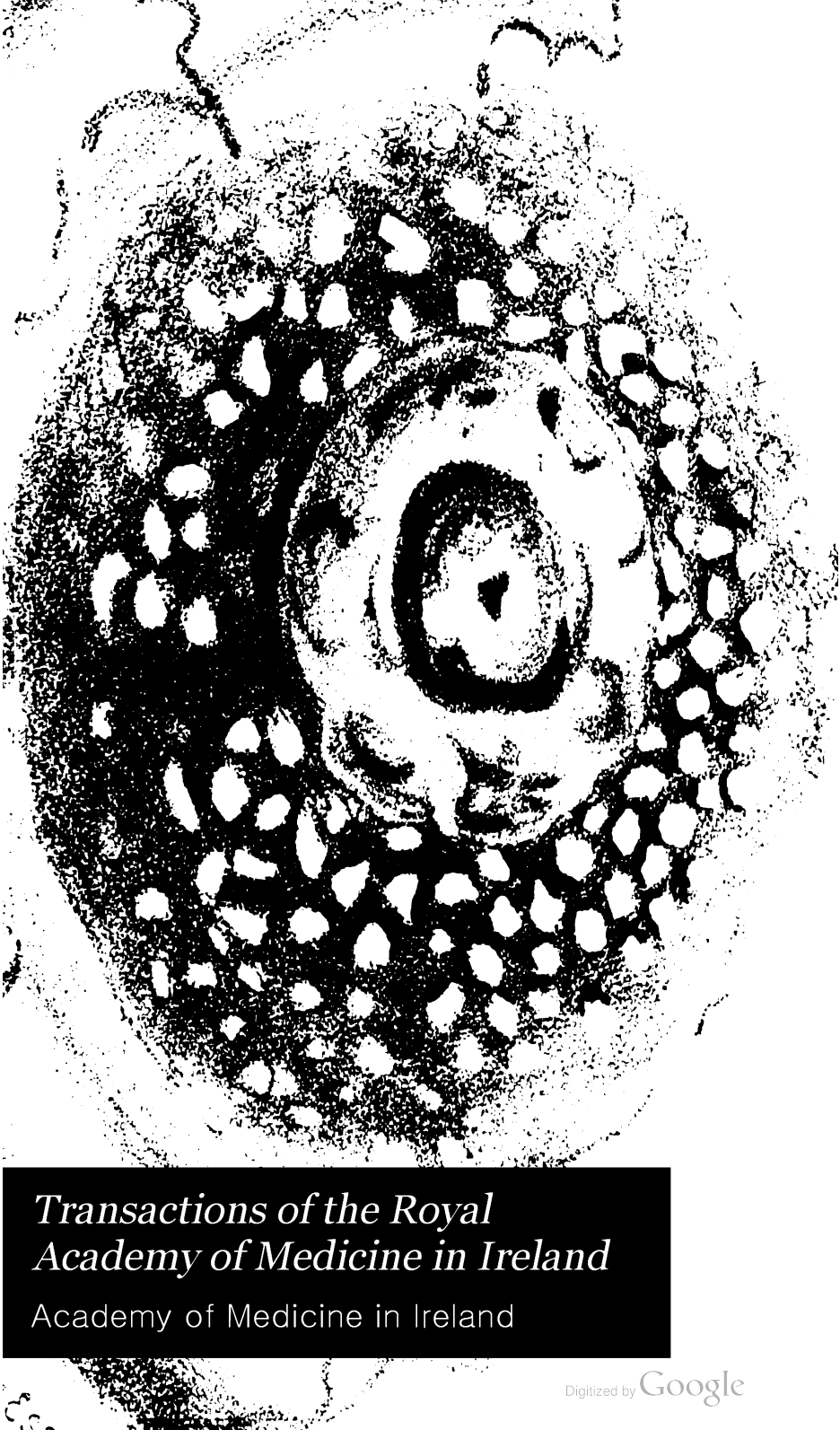

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TRANSACTIONS

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TRANSACTIONS

OF THE

Royal Academy of Medicine

IN IRELAND.

VOL. XIX.

EDITED BY

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† FRANKS, KENDAL, M.D., F.R.C.S., late Surgeon to Adelaide Hospital and to Throat and Ear Hospital, Dublin, Kilmurry, Johannesburg, South Africa.

1887 FRASER, ALEC, M.B., Professor of Anatomy Royal College of Surgeons, Ireland.

1891 GLENN, JOHN HUGH ROBERT, M.D., B.Ch., late Assistant Physician Rotunda Hospital, 24 Lower Baggot-street, Dublin.

1898 GOLDIE, GEORGE J., L.R.C.P.& S. Edin., L.F.P.& S. Glasgow, L.D.S. Edin., 10 Westland-row. [1]

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† HEUSTON, FRANCIS TYDD, F.R.C.S., late Professor of Anatomy Royal College of Surgeons, Surgeon Adelaide Hospital 15 St. Stephen's-green, N., Dublin. [1]

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1901 KEATING, GEORGE M., M.B., F.R.C.S., 11 Merrion-square, N.

1900 KELLY, THOMAS J., L.M., T.C.D., L.R.C.S.I., Enniscorthy.

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1889 M'BRIDE, CHARLES, M.D., F.R.S. Edin., Parochial Medical Officer, Wigtown, Scotland. [*Resigned.*]

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1900 Cullinan, Henry, L.R.C.P. & S., Richmond Asylum.

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1897 Hughes, Charles, L.R.C.P. & S.I., 27 Westland-row.

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1900 Massy, Evernia S. J., M.B., B.Ch., B.A.O., R.U.I., 52 Northumberland-road. [*Resigned.*]

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1885 Ridley, George P., L.R.C.S., L.R.C.P., Surgeon King's County Infirmary, Tullamore, King's County.

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Jaffé, Jacob J., 70 Lombard-street, W., South Circular-road.

Johnston, Marcus I., 5 Rathmines-road.

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RULES.

1. The name shall be, "ROYAL ACADEMY OF MEDICINE IN IRELAND." (1887.)

Constitution.

2. The Academy shall consist of Fellows, Honorary Fellows, Members, and Student Associates.

Management.

3. The affairs shall be managed by a Council, consisting of the President, Ex-Presidents (1893), the six Presidents of Sections, the General Secretary and Treasurer, the Secretary for Foreign Correspondence, six Secretaries of Sections, and eight Councillors, being two representatives from the Medical, Surgical, Obstetrical, and Pathological Sectional Councils respectively.

Meetings.

4. The Meetings shall be General and Ordinary.

Publication of "Transactions."

5. The "Transactions" shall be published by the Council, subject to the provisions hereinafter contained.

Original Fellows and Members.

6. All the Members of the present Societies (Medical, Surgical, Obstetrical, and Pathological) shall be Original Fellows or Members, without entrance fee, on payment of the annual subscription on or before 31st December, 1882.[a]

Fellows.

7. Fellows of the Royal College of Physicians of Ireland, and of the Royal College of Surgeons in Ireland, shall be admitted, without ballot, on payment of the entrance fee and the subscription for the current year. All others, being Registered Medical Practitioners not directly or indirectly engaged in the sale of drugs, shall be proposed by two Fellows, and elected by ballot by the Council.

8. Candidates shall be proposed at one Meeting of the Council, and balloted for at the next—one black bean in four to reject.

8A. That all Rules referring to the admission of Fellows, Members, and Student Associates shall be interpreted as referring to Ladies as well as Gentlemen.

Privileges of Fellows.

9. Fellows only shall be eligible for office in the Academy. They shall have the privilege of attending all Meetings of the Academy, of making Communications, and of voting and speaking at such meetings. They shall also receive a copy of the "Transactions."

[a] Those who have paid a Life Subscription to any of the above Societies will be admitted to the privilege of Fellows on payment of Member's subscription.

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10. These privileges shall not be exercised by any Fellow in arrear with his subscription.

Honorary Fellows.

11. Honorary Fellows, limited in number to 25, may be nominated by the Council, and elected, on motion at a General Meeting of the Academy by a majority of at least two-thirds of those present and voting.

Members.

12. Any Registered Medical Practitioner may be elected as a Member, the election to be conducted in the same manner as that of Fellows.

Privileges of Members.

13. Members shall have the privilege of attending the Ordinary Meetings of the Academy, of making Communications, and of taking part in debate. They can purchase the "Transactions" at cost price.

Student Associates.

14. Registered Medical Students may be elected Student Associates for the period of one year. The Subscription must be paid before election, and the Council may elect without notice of motion.

15. Student Associates shall have the privilege of attending the Ordinary Meetings of the Academy.

Annual Subscription.

16. Fellows shall pay £2 2s., and Members £1 1s. Student Associates shall pay 5s. The Subscription shall become due on the 1st of October in each year, and if the Subscription be not paid on or before the first Meeting in February, the defaulter shall cease to belong to the Academy, unless the delay shall be accounted for to the satisfaction of the Council. No Fellow shall vote at the Annual General Meeting who has not paid his subscription for the year. Medical Officers of the Army and Navy, and Registered Medical Practitioners not residing within 15 miles of Dublin, are eligible as Fellows of the Academy on payment of the entrance fee, and an annual Subscription of £1 1s.

Entrance Fee.

17. After admission of Original Fellows, all Fellows shall pay an entrance fee of £1 1s.

Council.

18. The Council shall meet on the first Wednesday in the month throughout the Session, or oftener should they see occasion—five to form a quorum.

19. Notice of all Extraordinary Meetings shall be transmitted by the Secretary to every Member of the Council. The President or any five Members of Council may call an Extraordinary Meeting of the Council. The Council shall determine questions by vote, or by division if so demanded, the President having a casting vote only. Any regulation of the Council shall have the force of a law, until submitted to the next General Meeting. The Council shall have the power of filling up any vacancies which may occur in the list of Officers of the Academy, except that of President, before the Annual General Meeting. If a vacancy in the office of President should occur, the General Council shall summon a Special General Meeting of the Academy to fill such vacancy. (1888.)

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Sectional Councils.

20. There shall be six Sectional Councils elected by the Annual General Meeting in October, termed respectively—the Medical, the Surgical, the Obstetrical, and the Pathological, the State Medicine, and the Anatomical and Physiological Councils.

21. No Fellow shall be eligible as a candidate for election on more than two Sectional Councils, but no Fellow shall be eligible as a candidate for election on both the Medical and Surgical Sectional Councils. (1888.)

22. Each Sectional Council shall consist of the President of the Section and ten Members, one of whom shall act as Secretary to the Section; except the State Medicine and Anatomical and Physiological Councils, which shall each consist of a President and six Members. (1888).

Meetings of Sectional Councils.

23. Each Sectional Council shall meet on a fixed day at least one week before the Ordinary Meeting of their Section, three to form a quorum.

Powers.

24. Each Sectional Council shall have the power of making any such arrangements as it thinks necessary to carry on the work of the Ordinary Meetings which are under its charge, provided that such arrangements do not interfere with the general laws of the Academy; and any Rules laid down by such Council shall have the force of laws at the Ordinary Meetings under its charge, until submitted to the General Council.

25. Each Sectional Council shall have the power of filling up any vacancies that may occur among its Members until the Annual General Meeting.

Committee of Reference.

26. The Council shall appoint a Committee of Reference, to report upon morbid growths and other specimens exhibited before the Academy; of this Committee the Exhibitor shall, for the occasion, be a Member.

Officers.

27. A President, to be elected by the Annual General Meeting in October, and to hold office for three years.

28. The Presidents of the Colleges of Physicians and Surgeons for the time being shall be the Presidents of the Medical and Surgical Sections. The Presidents of the other Sections shall be elected by the Fellows at the Annual General Meeting, and shall hold office for two years. (1888.)

29. One General Secretary and Treasurer to be elected at the Annual General Meeting.

30. It is expedient that a fixed salary (of one hundred guineas) shall be paid yearly to the General Secretary in consideration of the fact that the editing of the "Transactions" is part of his duties.

31. One Honorary Secretary for Foreign Correspondence to be elected at the Annual General Meeting. (1888.)

32. The Councillors for each Section to be elected at the Annual General Meeting. Each Sectional Council shall elect two Members to act on the

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General Council, except in the case of the Sections of State Medicine and Anatomy and Physiology. (1888.)

33. Two Members in each Sectional Council shall retire annually, and be ineligible for re-election for one year, except in the Council of the Section of Anatomy and Physiology, in which only one shall retire (Oct., 1896).

34. Six Secretaries, one for each Section, to be appointed by the Sectional Councils.

35. At all elections after the year 1882, any Fellow desirous of nominating a candidate for election shall, at least one fortnight before the Annual General Meeting, forward an application to the General Secretary to enter the name of such Fellow on the list of candidates for office, provided that the Fellow so nominated shall have consented to act. (1891.)

36. That all elections shall be by ballot, but Fellows residing more than 15 miles from Dublin, and those incapacitated from attending by illness (to be certified), may record their votes by ballot papers, sent to the presiding officer in sealed envelopes provided for that purpose (Oct., 1896).

37. That in all elections to the Sectional Councils there shall be affixed to the name of each candidate the number of meetings of that particular Section for the Council for which he is now a candidate that he has attended. (1898).

Duties of Officers.

38. *The President* shall preside at the Annual and Special General Meetings and at General Council Meetings. In the absence of the President, the Chairman shall be appointed by the meeting. (1888.)

39. *The Presidents of Sections* shall preside at the Ordinary Meetings of the Academy, and shall also preside at the Sectional Council Meetings. In the absence of the President, the Chairman shall be appointed by the meeting. (1888).

40. *The General Secretary* shall attend all General Meetings of the Academy and General Council. He shall take minutes of such meetings, to be read at the following meeting.

41. He shall receive and have charge of all papers intended for publication in the "Transactions" of the Academy, after they have been handed over to him by the Secretaries of the several Sections.

42. He shall, on receiving notice from the Secretary of a Section, send out to all the Members notices of the title or titles of the paper or papers for the next Ordinary Meeting, with the name or names of the authors, and, so far as possible, of the subjects for Exhibition, with the names of the Exhibitors.

43. He shall arrange for the Exhibition of specimens and the reading of papers, which are forwarded to the Academy by those who are absent, or are not members.

44. The General Secretary and Treasurer shall receive all moneys, and lodge the same in bank to the account of the Academy, and all cheques shall be signed by the Treasurer and one other Councillor.

45. The Accounts shall be audited by two Fellows, not Members of Council, to be appointed by the President at some meeting previous to the Annual Meeting.

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Duties of Secretaries of Sections.

46. To attend the Meetings of the Council of the Section and the Ordinary Meetings of the Academy, under the management of said Council, and to take minutes at such meetings, to be read at the next following meeting of that Section.

47. To keep such papers as the Sectional Councils recommend for publication, for the purpose of handing them over to the General Secretary.

48. To inform the Secretary of the Committee of Reference of any specimens referred to that Committee, and to transfer the specimens to that Secretary.

49. To give notice to the General Secretary, one week previously to the meeting, of the titles of papers for the evening, the names of the authors, and, so far as possible, the objects for Exhibition, with the names of Exhibitors, so that the General Secretary may inform the Members.

Meetings.

50. The Annual General Meeting to take place on the last Friday in October, for the election of Officers and Members of Council, and for the general business of the Academy.

51. Due notice of the meeting shall be given by the Secretary to all Members at least three weeks previously. (1891.)

52. No motion involving a change of these Rules shall be brought before this meeting except one week's notice thereof shall have been given by the Secretary to each Member.

53. The President may—and shall forthwith, on receiving a requisition signed by seven Fellows, at any time—on giving one week's notice, summon a Special General Meeting, for the consideration of particular business, the nature of which must be specified in the letter of summons convening the meeting, and at such meeting no other business can be transacted. In the event of the President being unable, from any cause, or declining, to summon a Special General Meeting of the Academy, it shall be in the power of the General Council to summon such meeting. (1888.)

Ordinary Meetings.

54. The communications to be submitted to the Ordinary Meetings shall be grouped under the following heads :—Medicine, Surgery, Pathology, Obstetrics, State Medicine, and Anatomy and Physiology ; and the conduct of such meetings shall be in the hands of the several Sectional Councils, each Sectional Council to have the management of the Ordinary Meeting in rotation, as arranged by the General Council. (1888.)

55. The Ordinary Meetings shall be held on every Friday evening, from the first Friday in November until the last Friday in May, inclusive, at eight o'clock, except during the Christmas and Easter recesses.

56. All Fellows, Members, and Student Associates attending the meetings, shall write their names in the attendance book.

57. Any Fellow or Member may introduce two Visitors by cards obtained from the Sectional Secretaries.

58. Officers of the Army or Navy Medical Departments shall, on presenting their cards, be admitted to the Ordinary Meetings of the Academy.

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59. No communication shall exceed twenty minutes in its delivery, nor any speech thereon ten minutes, except by permission of the Chairman. No one shall speak twice upon the same communication, except the author, who has the right of reply.

60. A paper by any other than a Fellow or Member of the Academy shall not be read before the Academy unless the author of such a communication shall have obtained permission to do so from the Council of the Section before which the communication is proposed to be read. (1892.)

Ordinary Meetings.—Order of Business.

61. (1.) Chair to be taken at 8 30 p.m.

(2.) Chairman to read list of specimens, &c., exhibited by card, together with the names of the Exhibitors.

(3.) No Pathological Specimen shall be exhibited at any Section other than the Pathological and Obstetrical, except by card. This Exhibition shall not exclude any subsequent communication regarding it at the Pathological Section.

(4.) There shall be no Exhibition of Specimens by card in the Obstetrical or Pathological Sections.

(5.) Any member shall have liberty to exhibit any recent specimen at any of the meetings of the Obstetrical Section, provided it illustrates any question in gynæcology.

(6.) At the meetings of the Obstetrical Section recent specimens may be exhibited, and the President shall invite discussion thereon, provided that such exhibition of specimens or discussion, if any, thereon, must terminate at 9 o'clock, p.m., but that, if necessary, they may be resumed after the papers for the evening have been read and discussed.

(7.) Chairman to ask if any member has any observations to make or motion to propose relative to any living specimen on the List of Exhibition.

(8.) Chairman to call upon the author of the first paper on the list to read his paper.

(9.) Chairman to call upon members to discuss the paper, or, at his discretion, to take any other paper or papers on the list relating to the subject, and have the discussion subsequently on all such papers collectively.

(10.) When the last paper has been discussed, the Chairman to ask if any member desires to speak upon any of the specimens exhibited by card.

(11.) After the discussion upon any specimen, the Exhibitor has the right of reply.

Regulations regarding the Exhibition of Specimens by Card.

62. (1.) Any member may exhibit by card at any Ordinary Meeting, except at the meeting of the Pathological and Obstetrical Sections. At the meetings of the Pathological all specimens must be presented and described *viva voce*, and debate may be invited hereon.

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(2.) Notice shall, if possible, be given to the General Secretary, or the Secretary of the Section, on or before the previous Ordinary Meeting.

(3.) Specimens must be in the room at 7 45 on the night of Exhibition.

(4.) Specimens for Exhibition by card shall be open for inspection at 8 p.m.

(5.) A card, containing all particulars for publication, shall be placed with the Specimen. Cards for this purpose are to be obtained from the Secretary.

(6.) The Exhibitor should be present, and he shall furnish further details if asked for.

(7.) Every Exhibitor shall submit the Specimen or Specimens on view to the Committee of Reference, if the meeting so decide.

Exhibition of Pathological Specimens.

63. No lengthened reference to treatment shall be allowed upon any Specimen, except by the express permission of the Chairman. Whenever it has been agreed that a Specimen exhibited at a Sectional Meeting of the Royal Academy of Medicine in Ireland shall be sent to the Reference Committee to report thereon as to its nature, the Exhibitor is to retain the custody of the specimen until he shall be summoned to a meeting of said Committee to be convened by its Secretary, on an early day, when he will attend and submit it for examination. (1889).

By-laws concerning "Transactions."

64. The "Transactions" shall consist of such Communications made to the Academy by or through Fellows or Members as may be deemed by the General Council suitable for publication; also, of discussions of importance or interest arising out of such Communications.

65. All Communications accepted by the Academy become the property of the Academy, but authors may also print their Communications, subsequent to the reading of the same before the Academy, in any publication in addition to the "Transactions." Papers shall be handed to the Secretary of the Section immediately after they have been read. (1891.)

66. The "Transactions" for the year shall be presented to all Fellows of the Academy who have paid their Annual Subscriptions.

67. The "Transactions" may be purchased by Members at cost price.

68. The Publication Committee of each Section shall meet not later than the Tuesday after each meeting of the Section, for the purpose of abstracting the proceedings—the abstract to be placed in the printer's hands on same evening, and forwarded to the editors of medical journals with the least possible delay. (1888.)

69. Contributors of papers may send their papers to the Academy printer early enough to allow of their being put in type before the meeting, provided the author be responsible for the cost of same should the General Council deem the communication not suitable for publication in the "Transactions."

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70. That on the evening of the day of meeting of the Sectional Council, when the papers for the next meeting have been decided upon, a circular be sent to each contributor informing him :—

(1.) That he is expected to be ready or else take his place at the bottom of the list.

(2.) That he must have an abstract ready with his paper, otherwise he will be noted in the published proceedings in such form as the Publication Committee think fit.

71. The General Council is empowered to defray the expenses in whole or in part of any illustrations which it may consider advantageous to the elucidation of the papers published by the Academy.

72. An abstract (prepared by the author) of each communication made at the Academy, along with a report of the discussions thereon, shall be furnished to the editors of such medical journals as may desire to publish them, and the authors of such communications shall be empowered to publish their papers *in extenso* in any periodical or periodicals they may think fit, such communications also to appear in the "Transactions," provided the Council consider them worthy of insertion.

Expulsion of Fellow or Member.

73. Expulsion of a Fellow or Member can take place only at a General Meeting of the Academy, on the motion of the Council, if two-thirds of the Members present shall vote for the same by ballot. Of such ballot the Council must give at least fourteen days' notice in writing to every Fellow of the Academy.

New Laws.

74. New Laws, or alterations in existing Laws, can be proposed only at the Annual General Meeting. Any Fellow proposing such alteration shall give notice to the General Secretary at least ten days before the General Meeting in October.

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REPORT.

THE General Council begs to report that the number of Fellows for the Session 1899–1900 was 231; of Members, 31; and of Student Associates, 16. The Fellows decreased by 9, the Members by 1, and the Student Associates by 4.

The Council regret that the Balance Sheet again shows a deficit in the shape of an overdraft at the Bank. This is partly due to the large expenditure on microscopes in the preceding session, and partly to the unusual cost of the Volume of Transactions for 1898–9. The receipts have been reduced by the loss of several Fellows from deaths or resignations, but as the list of Fellows is being constantly recruited by admission of all the younger members of the Profession in Dublin who exhibit any zeal for the advancement of Medical Science, the Council expects that the present deficit will shortly be turned into a surplus.

Her Majesty the Queen visited Dublin during the past session, and was graciously pleased to receive the following address from the Royal Academy:—

"MAY IT PLEASE YOUR MAJESTY,

"We, the President, Council, and Fellows of the Royal Academy of Medicine in Ireland, desire humbly to approach your Majesty to tender to you respectfully our warm and heartfelt welcome on the occasion of your visit to Ireland.

"It is with extreme gratification that your loyal subjects here see your Majesty once more in Dublin, and we trust that the spontaneous enthusiasm of your

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reception has rendered it superfluous for us to impress upon your Majesty the deep feelings of respect and affection with which your person is regarded by the inhabitants of our principal city.

"It must be to your Majesty a source of satisfaction to observe the very remarkable improvement in the state of this island since your last visit to our shores. In health, wealth, and general well-being the people of this part of your dominions have, during the latter years of your beneficent reign, attained to a position which has never been even remotely approached during our past history.

"As members of the Medical Profession we gratefully acknowledge the gracious encouragement your Majesty and the Members of your Royal Family have always given to our Profession, and we beg respectfully to assure your Majesty of our loyal attachment to your throne, person, and family.

"We pray that your life and health may long be preserved to enable you to reign over a prosperous and contented people.

"E. H. BENNETT, President.
"J. B. STORY, Gen. Sec."

The following reply to the Address was forwarded to the President:—

"I thank you for the loyal and dutiful Address which you presented to me on the occasion of my visit to Ireland.

"I am much gratified by your loyal and kindly regard towards my throne and person, and by the cordial welcome which I received."

The following resolution from the Section of State Medicine was brought before the General Council by the Sectional Secretary:—

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"That the project of establishing a Central Laboratory in connection with the Irish Lunatic Asylums for the study of the pathology of nervous and mental disease is deserving of the support of the Royal Academy of Medicine in Ireland, and that the General Council be asked to communicate with Asylum Boards throughout Ireland on the subject."

The General Council thereupon passed the following resolution:—

"That the General Council approves the project of establishing a Central Laboratory in connection with the Irish Lunatic Asylums for the study of the pathology of nervous and mental disease, and recommends the Royal Academy to take such steps as may be deemed expedient to give effect to the proposal."

The subject will be dealt with in the first motion, of which notice has been given on the agenda.

The Council records with deep regret the loss the Academy has sustained by the deaths of the following Fellows:—James A. Baird, H. J. Broomfield, T. W. Grimshaw, Edward Hamilton, J. E. Kenny, Samuel R. and Thomas P. Mason, Stephen O'Sullivan, R. G. Patteson, James Smith, Sir William Stokes, Secretary for Foreign Correspondence; and W. I. de C. Wheeler.

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General Treasurer's Report for the Session 1899–1900.

RECEIPTS.

	£	s.	d.
To Subscriptions and Entrance Fees -	474	8	0
,, Dividends - - - -	19	13	4
,, Fannin & Co., Ltd., part Cost of Illustrations—Vol. XVII. - - -	8	10	3
,, Overdraft on Bank - - -	80	7	7
Total - - - -	£582	19	2

EXPENDITURE.

	£	s.	d.
By Balance due to Bank - - -	33	1	1
,, General Secretary - - -	105	0	0
,, Printing, Stationery, and Postage -	59	11	10
,, Transactions, Vol. XVI., and Illustrations	268	19	6
,, Royal College of Surgeons - -	15	15	0
,, Royal College of Physicians - -	15	15	0
,, Reporters - - - - -	29	8	0
,, Servants - - - - -	20	10	0
,, Groceries and Milk - - -	18	9	11
,, Lantern - - - - -	2	7	4
,, Special Fees - - - -	8	8	0
,, Address to Her Majesty - - -	4	4	0
,, Interest on Account - - -	1	9	6
Total - - - -	£582	19	2

We have examined the Accounts and Vouchers, and certify the same to be correct.

October 5th, 1900.

F. T. PORTER NEWELL, F.R.C.S.
E. H. TAYLOR, F.R.C.S.

The Capital is invested in the names of Sir George Duffey, Sir William Thomson, and Dr. Walter G. Smith.

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Volume XVIII. of the "Transactions" has been forwarded to the following:—

IRELAND:—

Medical Press	Dublin.
National Library	Do.
Royal College of Physicians	Do.
Royal College of Surgeons	Do.
Royal Irish Academy	Do.
Royal Dublin Society	Do.
Royal University	Do.
Trinity College	Do.
Queen's College	Belfast.
Do.	Cork.
Do.	Galway

ENGLAND:—

Birmingham Medical Review	Birmingham.
Medical Institute	Do.
Bristol Medico-Chirurgical Journal	Bristol.
Medical Annual	Do.
University	Durham.
Liverpool Medico-Chirurgical Journal	Liverpool.
British Dental Association	London.
British Medical Journal	Do.
Jenner Institute of Preventive Medicine	Do.
King's College	Do.
Lancet	Do.
Library, British Medical Journal, 429 Strand	Do.
Medical Magazine	Do.
Medical Review (Med. & Surg. Review of Reviews)	Do.
Polyclinic, 45 St. Martin's-lane, W.C.	Do.
Public Health, 19 Bloomfield Road, Maida Vale	Do.
Royal College of Physicians	Do.
Royal College of Surgeons	Do.
University	Do.
University College	Do
Victoria University	Manchester
Quarterly Medical Journal, 342 Glossop Road	Sheffield.

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SCOTLAND :—

University	Aberdeen.
University College	Dundee.
Royal College of Physicians	Edinburgh
Royal College of Surgeons	Do.
Scottish Medical and Surgical Journal	Do.
University	Do.
Faculty of Physicians and Surgeons	Glasgow.
University	Do.
Do.	St. Andrews.

EUROPE :—

University	Amsterdam.
University Library	Berlin.
University College	Bologna.
Archives Cliniques de Bourdeaux, 46 Cours du Jardin-public	Bordeaux
Journal de Medicine	Do.
Académie Royale de Médecine de Belgique	Brussels.
L'Année Chirurgicale	Do.
Société Belge de Chirurgie	Do.
Université Libre	Do.
University College	Christiania.
Académie de Médecine	Copenhagen.
La Grèce Medicale, Syra	Greece.
University College	Madrid.
Archivio di Ortopedia	Milan.
Académie de Médecine	Paris.
Archives Orientales	Do.
Archiv. Provinciales de Médecine	Do.
Revue de la Tuberculose	Do.
Revue de Chirurgie	Do.
University of Paris	Do.
Imperial University	St. Petersburg
Royal Carolinska Med. Chir. Institution	Stockholm.
University Library	Strassburg

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EUROPE—*con.*—

Medical Society, Royal University	Upsala.
University	Vienna.
Naturforschende Gesellschaft, Dr. Rudolf Martin, Seefeldstrasse 119	Zurich.
Archivio Italiano di Otologia	Turin

AMERICA :—

Johns Hopkins University	Baltimore
Brooklyn Medical Journal	Brooklyn.
Magill University	Montreal
Academy of Medicine, 17 West 43rd Street	New York.
New York Medical Journal, 66 West Broadway	Do.
University	Do.
American Journal of the Medical Sciences	Philadelphia.
Association of American Physicians	Do.
College of Physicians	Do.
University of Pensylvania	Do.
University College	Quebec.
University Lavel	Do.
University of Toronto	Toronto.
Annals of Gynæcology and Pediatrics, 148 Pearl Street, Boston, Mass.	United States.
Charlotte Medical Journal, Charlotte, N. C.	Do.
Library, Surg.-General's Office, Washington	Do.
Journal of Comparative Neurology, Denison University, Granville, Ohio	Do.
Medical Library Association, 19th and Stout Streets, Denver, Colorado	Do.

AUSTRALIA :—

University	Adelaide.
Do.	Auckland.
Do.	Melbourne.
Inter-Colonial Medical Journal	Do.
Medical Society of Victoria	Do.

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AUSTRALIA—*con.*—

University of Otago - - - -	New Zealand.
The Australasian Medical Gazette, - -	Sydney, N.S.W.
University of Sydney, care of Young J. Pentland, 38 West Smithfield, London, E.C. - -	Do.

ASIA :—

Bombay University - - - -	Bombay.
University - - - - -	Calcutta.
Imperial University Library - - -	Tokio, Japan.

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Royal Academy of Medicine in Ireland.

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TRANSACTIONS

OF THE

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

TWO YEARS OF OPEN-AIR TREATMENT OF CONSUMPTION IN IRELAND.

By F. HOWARD SINCLAIR, M.D., L.R.C.P.I.;
Visiting Physician, Foster Green Hospital for Consumption;
Consulting Physician, Belfast Hospital for Sick Children.

[Read in the Section of Medicine, November 16, 1900.]

It is now everywhere recognized that a lack of fresh air is one of the greatest predisposing causes of phthisis, and that a liberal supply of open air is one of the best means of restoring the consumptive to health. The keynote of this treatment is a *life in the open air*, and it is the very simplicity of the remedy that seems to have acted as a deterrent to its use.

Since 1888 I have held the post of visiting physician to the Belfast Hospital for Consumption, and as each vaunted remedy has been trumpeted by its advocates I have made a point of giving it a trial.

In 1891 *Tuberculin*, Koch's remedy, raised a hope that at last something tangible had been attained, and from the results in non-febrile cases, where the physical signs were

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not *very* marked, I must confess I do not join in the universal condemnation of *tuberculin.*

Then we have had, and still have with us, the internal administration of antiseptics—creosote and guaiacol preparations more especially—their intra-laryngeal injection—inhalation and hypodermic use, and finally the use by rectal injection. With the exception of the last, common humanity compelled me to use all these. It was not, however, until Dr. Burton Fanning in 1896 gave the result of his trial of the open-air method in a convalescent home at Cromer, on the Norfolk coast, that the possibility of adopting in its entirety this now well-known treatment suggested itself to me.

I then began to carry out the method in the Belfast Hospital for Consumption, which a short time before had been presented with a magnificent and well-timbered site of 40 acres by Mr. Foster Green, and is now known as the Foster Green Hospital, accommodating 30 patients.

During that winter the difficulties of open-air treatment in a place not specially constructed for this particular method were felt very acutely—as with certain winds, in spite of a sheltered position, the rain persisted in beating into some of the rooms.

The committee, however, came forward very handsomely, and on the recommendation of the staff a verandah, about 100 feet in length, was built, which now enables the patients to remain out until bedtime. Two large shelters with removable panels, and with a different aspect, were also placed in the grounds. The use of these shelters in fine weather is not encouraged, as it is found that, as a rule, patients do better when right out in the open.

For the same reason my patients are not allowed to make use of the sitting-room. Any writing or work can be quite as well accomplished on the verandah.

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At first one finds that patients are inclined to rebel against remaining out when the air is loaded with moisture, but they soon get to recognise that when well wrapped up the fear of getting cold is groundless. The fogs in the valleys of the Rhine and Maine are familiar to every tourist, but it is in the valleys of these rivers that some of the most elaborate and successful of Continental sanatoria are situated.

When some time ago conversing on the subject of the successful treatment of consumption with Dr. Dettweiler at Falkenstein, he laid special emphasis on two points—

1. The early commencement of the treatment;

2. Carrying it out in the climate to which the patient is accustomed.

Dr. Dettweiler's first aphorism everyone must recognise. Cases must be taken at an early stage if the word *cure* is ever to be used, and this cannot be too strongly impressed on the friends of patients.

If in doubtful febrile cases advantage were taken of a microscopical examination of the sputum much time might be gained, and many more authentic "cures" of consumption would be recorded.

The second statement on which Dr. Dettweiler laid emphasis was one which at the time took me rather by surprise—for has not change of climate always been looked upon by the great body of our profession as a panacea for those ills which steadily fail to respond to the routine of drug treatment?

When therefore a man with such immense experience in dealing with consumption throws the weight of his authority into so remarkable a statement as "Don't send your consumptive away from the climate in which he was brought up"—it must not be dismissed summarily.

In the climate of Germany very remarkable statistics have been developed of the results of the treatment of con-

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sumption. Many of us have spent a few seasons in Germany or Austria, and must retain impressions vivid and lasting of the extremes of temperature that characterise these countries—the bitter coldness of an ordinary winter and the stifling heat of summer do not certainly offer better chances to the consumptive of enjoying the pleasures of an open-air life.

I mention these facts merely for the purpose of showing that a perfect climate is not a necessity for the successful carrying out of a fresh-air treatment.

There are certain conditions that are common to every place suitable for the treatment; though there is proof that patients will get well in almost any part of the world, it is equally certain that there are some places which hold out much more hopeful possibilities of cure than others.

The principal necessity is that the atmosphere should be free from contamination by smoke or proximity to a large town—that the patients should be protected from dust, from strong winds, from rain, and from excessive heat and cold.

The success which attended the adoption of open-air methods in the hospital for the poor which I have referred to impressed me with the desirability of being able to treat patients of the better classes in their own country also. I devoted the early months of 1899 to a search for a place which would fulfil as many of the conditions as possible, and my choice finally fell on a site, three miles from Rostrevor, which has been unanimously described as ideal, by those members of the profession who have visited it.

The soil is gravel, and the site is a knoll rising between three hills at a height of 350 feet above the sea level. The Mourne Mountains stretch away to the north-eastward, while a hill of 500 feet protects from westerly gales.

The local surroundings are such that there has been no

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day since patients have been under treatment sixteen months ago that a high wind has proved prohibitive to the outdoor life, or that it has been necessary to have the window sashes placed in the bedroom windows.

As Brehmer says, "Strong winds are poison"—and as well as having local shelter by hills and shrubberies, properly constructed verandahs and shelters will always be found useful in our Hibernian climate. I therefore built three verandahs—south, west, and north—to meet the various possibilities of weather, as well as two shelters which revolve on castors.

That full advantage may be taken of these shelters it is, of course, necessary that they should be well lighted, and for outdoor use the only satisfactory method is electricity, as ordinary lamps when enclosed in lanterns give anything but a cheerful result.

There is a great deal in the site and the surroundings of a sanatorium, but for the purpose of successful treatment there are certain rules of life which must be enforced. On this account it is always a disadvantage to permit friends of patients to remain and sit with them. As a rule they fail to understand why the patient should not do exactly as he chooses. Home treatment cannot, I fear, be regarded as a success. There is a strong tendency either to overdo it by exposure to strong winds bringing on bronchitis, or gastritis from over-eating. It is also difficult to get it understood that A, who has bad powers of recuperation and an extensive tract of lung involved, will not be quite well and ready to leave in three months, as B was. Improvement must be counted by months and not by weeks or days.

The regularity of the life begins at once to tell in the steady gain in weight of from one to four or five pounds a week, the cessation of the severe cough and of the night sweats. The amount of sputum, too, decreases rapidly

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from 3 to 4oz. in twenty-fours to a few drachms. How far a gain in weight is an advantage to the patient is a point which may be justly combated.

A few weeks ago I admitted a patient who lost four pounds during the first week, although the lung condition had decidedly improved.

The real cause of the loss of weight in that case was the clearing up of an œdematous state of the lower extremities.

On the other hand, one sometimes hears of sanatorium patients increasing in weight although in a dying condition.

I have referred chiefly to the necessity of the open-air life. The next important factor is the amount of rest and of exercise. On the judicious allotment of these periods much of the success depends. And it is on this rock that home treatment so often goes shipwreck.

In most cases walking exercise is the best suited to the powers of the patient, and the walks ought always to be so arranged that the return to the sanatorium is made down hill, a point which seems to have been overlooked in several sanatoria I have visited. Many patients may be allowed to vary their exercise by such games as croquet, put-put, and "deck quoits." I have also small gardens allotted to those who are fond of flowers. Such occupations, together with sketching and photography and occasional competitions, keep them from feeling enforced isolation irksome.

It used to be the custom in our chest hospitals to advise our patients to "remain out in the air as long as you can." The usual result of instruction so indefinite was that the patient walked about until utterly fagged out, he then sat down on a seat, without extra wraps, in a park, and finally reached home thoroughly chilled and miserable.

Now in the majority of hospital cases especially, a febrile disturbance is present, and exercise is much less demanded than complete rest. I therefore had a number of cane

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lounges made, to a pattern which, by forming a double inclined plane, places the patient in a position where he can remain for hours at a time without wearying.

As the fever subsides the period of rest is shortened until he is able to walk ten or twelve miles a day, and one hour of rest only before each meal is insisted on.

The other factor which is dwelt on with varying force by every sanatorium physician is the proper dieting. On the one hand we have the plan pursued by Dr. Walther, of giving three huge meals a day and insisting on those meals being finished, and on the other hand there is the plan adopted at Goerbersdorf, where Dr. Brehmer established the open-air treatment, and at Falkenstein, where Dr. Dettweiler still retains the post of visiting physician. The latter plan consists in giving—besides the three meals—milk before breakfast, and between the other meals, and a light supper at bedtime.

My own experience has been in favour of this method, and I think most patients can retain food better when the stomach is not overloaded with a large quantity at a time.

Most patients before going in for treatment have lost weight, varying from a few pounds to as many stones, and if anything over a pound a week is gained regularly we may feel satisfied that progress is being made.

The more one goes into the history of the origin of consumptive cases, the more one must feel convinced of the correctness of regarding it as infectious. The most consoling point about it is that it is an infectivity confined to the sputum, and by concentrating our attacks on the offending expectoration the consumptive ceases to be a danger to his neighbour.

This is not quite such a simple matter as at first sight it appears. The utensils used by a patient—cups, spoons, and forks—must each be disinfected.

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My patients are supplied with washing pockets, and the upper part of the blankets are stitched over with a washing material, as it was found that occasionally sputum was smeared over the blankets.

The Dettweiler sputum flasks are useful, and are now made in many modified forms, but Martindale's flask, which has no screw in the bottom and is free consequently from the danger of leakage, is used at the Foster Green Hospital.

Important as it is to impress on patients their duty with regard to conveying infection to others, it is none the less necessary to see that they take precautions against self-infection. Swallowing expectoration is by no means an uncommon practice, and is, I feel sure, responsible for much of the abdominal infection frequently complicating the lung affection. As in every other form of treatment, it would be absurd to attempt to lay down a rule which should be indiscriminately applicable to every case.

It is, I think, the insistence by patients who have themselves been treated by some particular method, that that particular method is the only one producing satisfactory results. is liable to bring open-air treatment into disrepute. Cases have come under my own observation where an abuse of natural laws by persistence in over-feeding, when sufficient warning had been given to moderate the amount of food, had been ignored with disastrous results.

To follow in the lines of so mature a master of his subject as Dr. Dettweiler we can with confidence continue to anticipate satisfactory results, and I think we must be satisfied with the fact that of all known methods of treatment of phthisis the hygienic, open-air or sanatorium principle stands easily at the head of the list.

Dr. Little pointed out the omission of the name of Dr. MacCormac, another Belfast man, who was the first to advocate

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this treatment, though the manner in which he brought forward his views did not lead to a favourable reception at that time. He spoke favourably of Falkenstein, which he had visited, and he was struck by the small amount of exercise patients were allowed to take there, the physicians prescribing five or ten minutes' exercise much as they would a drug. At Falkenstein a large quantity of wine and brandy was used, especially in combating pyrexia. Here their experience was that wine and brandy were rather injurious in pyrexia.

Dr. Finny said this paper brought out the point that it was not necessary to send patients away for the benefit of this treatment. Unfortunately, however, they had too little accommodation for the poor in this respect. Every day the view was more and more impressed upon him that the points determining the choice of locality were those Dr. Sinclair had referred to—namely, freedom from dust, freedom from the neighbourhood of cities, where the air was loaded with the products of combustion, and perfect quiet. With regard to the question of a dry or wet climate, moisture, which was very harmful to bronchitic cases, was not, as a rule, injurious to cases of consumption.

Dr. O'Carroll said they all agreed that this new departure in the treatment of phthisis was a very valuable one. Still there was a tendency to overvalue its effect. What he meant was that this was not a treatment, and it had very little more effect in phthisis than in any other condition in which, formerly, the patient had, according to superstition, lived in foul air. They all knew how for generations the chronic bronchitic patient sat in the house, and wrapped himself up in flannel until he brought out a foul rash, and put himself in such a condition that he could hardly recover from anything. With his experience of Newcastle (Co. Wicklow) Hospital he was quite prepared to back up every word that could be said in favour of the open-air treatment. Still they should be careful lest they should overdo the treatment. For instance, a highly febrile patient was not fit for such methods. As an indication of improvement he laid great stress upon the general condition of the patient as regarded temperature, pulse, the condition of the alimentary canal, rather than upon any gain in body weight, and he instanced cases where the weight test proved fallacious—in fact, he believed there was a condition which might be termed fat phthisis, in which the patient grew very fat owing to deficient oxygenation.

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Dr. Cox said he joined in the proper scepticism which Dr. O'Carroll had evinced as to the suitability of the open-air method in every case. Nevertheless, he was able to recall several examples of cure by this procedure. Some time ago he saw an interesting case of advanced phthisis in one of his profession. There was a cavity in one lung, which was treated surgically by the excision of two ribs, and the passage of a drainage tube right through the cavity. If they had relied upon drugs or fresh air alone in this case the patient would inevitably have died.

Dr. McWeeney said it was a common belief that, when the sputum became small in quantity, and that when the case had obviously improved, the infectivity of the sputum was diminishing and the number of bacilli in it was small. Last week he had a striking example of the opposite state, when he found the scanty sputum of a patient, who had gained in weight, and had improved in every way, loaded with bacilli. He ventured to plead most urgently for the continuance of the tuberculin treatment, not in its original form, where it was considered necessary to produce violent constitutional disturbance, but in small doses, continued for a fortnight at a time with intervals. He did not advocate it from clinical experience, but he had read most carefully worked-out accounts of the effects of this treatment of patients in Germany, and he was convinced that important results could be achieved by it.

Sir J. W. Moore said that in this discussion no one had mentioned the word sunlight, and sunlight played a part by no means second to that of fresh air. They all knew that sunlight itself was a bactericide of the first importance, and also when they recollected the depression that pulmonary consumptives suffer from in cloudy and foggy weather they recognised its importance. He believed they ought to have meteorological stations in connection with the different sanatoria, and he insisted on the necessity of taking sunlight observations.

Dr. Parsons observed that he was acquainted with a great number of so-called specifics for phthisis, his own recollection extending from the mullein plant to creosote, carbolic acid, guaiacol, &c., at the present time. Drugs, he believed, were going to take a big place in the future, probably in the form of antitoxin, in the treatment of phthisis, but till then their treatment must be essentially a hygienic and dietetic one. He agreed that, as an indication of improvement, a gain in weight was *per se* of very little value, and at Newcastle Hospital they found that the very worst

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cases often gained greatly in weight. With regard to the tuberculin treatment which had been referred to, he did not, personally, hope for very much from it.

The President related the case of a patient with some obscure form of abdominal disease. The abdomen was opened, and, on examination, it was found that the whole of the visceral and parietal peritoneum was studded with little masses like grains of sago. The patient made a rapid recovery from the laparotomy, and got completely well. The explanation given by the pathologists was, that the tubercle bacilli being anaerobic, the exposure of the peritoneum to light and air had the effect of destroying the organisms. It seemed to him that there was an analogy between this case and lung cases, and if they agreed that these organisms were anaerobic, and were destroyed by the influence of pure air, they must recognise that the open-air treatment was a distinct and specific treatment. They must remember, as Sir J. W. Moore had pointed out, that in addition to open air there must be sunshine, and that the air must be pure and must be still.

Dr. Howard Sinclair, in replying, said he had frequently tried alcohol in persistent high temperatures without any marked result. Even in advanced cases life was undoubtedly prolonged by open-air treatment. Some cases of bronchitis and asthma were benefited, but he would not advise its use in those cases. Tuberculin was used in the Adirondacks Sanatorium. Meteorological observations are made at the Foster Green Hospital. Less gain in weight in cold months was probably due to the patients referred to not adopting open-air treatment in its entirety.

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CHLORIDE OF CALCIUM.

By NINIAN FALKINER, M.D. Univ. Dubl.; F.R.C.P.I.;
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[Read in the Section of Medicine, December 14, 1900.]

The physical and chemical properties of calcium chloride are familiar. It is prepared, according to the British Pharmacopœia of 1867, by adding $CaCO_3$ to HCl until the acid is neutralised, the following simple formula representing the chemical change that occurs:—

1. $CaCO_3 + 2HCl = CaCl_2 + CO_2 + H_2O$.

Some chlorinated lime and slaked lime are now added to the solution, which is filtered and evaporated until it becomes solid, and dried at a temperature of 400°F.; the formula given in the British Pharmacopœia of 1864 for the product was $CaCl_2$ and the dose from 10–20 grains. The following formula shows that the action of the $Ca(ClO)_2$ and $Ca(OH)_2$ is to remove the iron present as $Fe_2(OH)_6$.

2. $2Fe\,Cl_2 + 2Cl = Fe_2\,Cl_6$.

3. $Fe_2\,Cl_6 + 3Ca(OH)_2 = Fe_2(OH)_6 + 3CaCl_2$.

In the Pharmacopœia of 1885 the directions are the same, but the formula given is $CaCl_2\,2H_2O$, and the dose 3–10 grains; a preparation—the liquor calcii chloridi—is also given, containing 1 grain in 5 minims, and given in doses of 15–50 minims.

In the Pharmacopœia of 1898 the formula is given as $CaCl_2\,2H_2O$ and the dose 5–15 grains, and the liquor is omitted.

This salt has many uses in Pharmacy and Practical Chemistry, and on account of its deliquescent properties it is used as a desiccator or dehydrant. It has been recommended

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by E. Divers (see *Phar. Jour.*, p. 150, 1871) as a test to distinguish between a carbonate and a carbamate of NH_4 in solution. This salt must not be confounded with the "calx chlorinata," "bleaching powder," or "calcium hypochlorite," which is sometimes called chloride of lime, and is an irritant or corrosive poison, according to the strength of administration.

When living as clinical clerk in the Rotunda Hospital, in the year 1886, I read a paper by Mr. Arthur Davis, which appeared in the 36th Vol. of *The Practitioner*, p. 12. The paper was so evidently honest in its advocacy of the use of this drug, that it left an impression on my mind in its favour. Dr. Davis recommended its use in lymphadenoma and in all cases of glandular enlargement where suppuration had not taken place.

In the use of the drug he urged that three points should be borne in mind—

1st. The necessity of a cautious but gradual increase in the strength of the dose taken.

2nd. The steady persistence in its use for a lengthened period.

3rd. Its uselessness in cases where suppuration had already commenced.

It appears that the drug was introduced into practice at the end of the last century by Antoine François de Fourcroy, 1755–1809, a French physician, in whose hands it met with great success.

In the year 1883 there appeared in the New Sydenham Society's Series, a volume of Warburton Begbie's Works, edited by Dr. (now Sir) Dyce Duckworth, in which there is a paper which gives an account of the therapeutical action of the muriate of lime.

The following extract from Begbie's paper shows that $CaCl_2$ will act as an irritant poison:—

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"Th. Beddoes gave 3iii. to a dog about six months old. The animal was soon affected with quick breathing and snorting, with convulsed but vain efforts to vomit, and a profuse excretion of saliva, and death occurred in about six hours. Upon opening the dog the thoracic viscera were found to be apparently sound. The villous coat of the stomach, and of the small intestines a great way down, was exceedingly bloodshot. In many parts it was almost black, and converted into a gelatinous slime, which could be taken off by the finger with great ease."

When exhibited in large doses to man the muriate of lime excites nausea and vomiting, and sometimes purging, causes tenderness in the præcordium, quickens the pulse, and occasions faintness, weakness, anxiety, trembling and giddiness.

In excessive or poisonous doses disorder of the nervous system is manifested by failure and trembling of the limbs, giddiness, small contracted pulse, cold sweats, convulsions, paralysis, insensibility and death.

When given in small and repeated doses it produces increased secretion of mucus, urine and perspiration.

In practice I have frequently used the drug, and believe it is useful, particularly with children who are subject to glandular enlargement. I was in the habit of giving it in combination with syr. phosp. co., syr. calcis lactophos., or syr. ferri iodidi, and believe that it always caused a reduction in the enlarged glands or their apparent disappearance.

About a year ago another and much more striking use of the chloride of calcium was brought under my notice as follows:—

A girl whom I had attended previously for ulceration of the stomach, with hæmorrhage, came to me in great distress. She had severe pain in the epigastrium, increased by the slightest movement or pressure. I suspected

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perforation in this case, and sent her over to Dr. Littledale, then House Surgeon in Sir P. Dun's Hospital.

She came to me shortly after, quite relieved, thanking me for having sent her to Dr. Littledale, and asking to have the medicine repeated. I ascertained from Dr. Littledale that the bottle contained 10 gr. doses of $CaCl_2$, to be taken three times daily.

I have used it since on numerous cases—some of whom I know to have had ulcer in the stomach, and in many I have suspected it—with the greatest benefit to the patient. The pain disappears, and nourishment is almost immediately resumed and digested under the influence of the drug.

Had I remained in practice I intended to have given it an extensive trial in all forms of the remote hæmorrhages, and in the other diseases for which it has been recommended by so many competent authorities.

Not having seen any statement concerning the action of calcium chloride upon the excretion of calcium by the kidneys, I undertook two quantitative gravimetric estimations, as follows:—

1. The estimation of CaO in the "urine of 24 hours," under "normal conditions."

2. The estimation of CaO in the "urine of 24 hours, on the third day of taking, '600 centigrammes of calcium chloride in the day.'"

I made three estimations in each case, using the method given by Dr. M'Munn for the estimation of calcium, up to the last stage, when, acting on the advice of Mr. L. Werner, F.C.S., assistant to Professor Emerson Reynolds, I heated with ammonium carbonate and weighed as a carbonate.

The result of a series of experiments gave the following:—

Normal urine contained 25 centigrammes CaO in 24 hours.

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Calcium chloride urine contained 43 centigrammes CaO in 24 hours.

So that it would appear that 18 centigrammes of calcium oxide were absorbed and excreted by the kidneys on the third day that the salt was administered. Taking 600 centigrammes of $CaCl_2 2H_2O$, it represents 230 centigrammes of CaO, so that 18 centigrammes would represent 7·5 per cent. of the CaO, taken as excreted by the kidneys.

I will conclude this paper with some of the principal modern references to the use of the drug:—

Hæmophilia (Wright, *Canadian Practitioner*, June, 1896).—Hæmorrhages and urticaria, associated with diminished coagulability of the blood. He found that, in the case of a boy with severe hæmophilia, the coagulation period exceeded 54 mins. at a temp. of 18·5° C. After two 2-gr. doses of $CaCl_2$ it was diminished to 25 minutes, and after a further dose of 2 grs. to 13½ mins. At a later period the normal coagulation was 14 mins., but after 20·6-gr. doses this was reduced to 6¾ mins.

Uterine Hæmorrhage (Routh, in *Clinical Journal*, Dec. 18, 1895).—$CaCl_2$ in the form of liquid (1–5), 2–3 dr. doses; its action is due to the fact that the blood coagulates much more easily under its influence.

Urticaria.—Wright (*British Journal Dermat.*, 1896) considers the theories which seem to justify the administration of $CaCl_2$ in urticaria. In all conditions of diminished blood coagulability there is not only a tendency to actual hæmorrhage, but there is also a tendency to serous hæmorrhage or an increased transudation of the fluids of the blood into the tissues. Persons whose blood coagulability is diminished appear to be particularly liable to urticaria or to serous effusions into the skin. Instances are cited in which urticaria could be produced by diminishing the blood coagulability by taking inordinate doses of $CaCl_2$ and by

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eating acid fruits, which diminish the blood coagulability by abstracting lime salts from the blood. These facts show that an increased transudation may be due to a diminished blood coagulability; hence hope may be entertained of correcting the defect of blood coagulability. With this object in view, $CaCl_2$ was employed in two cases in doses of 30 grs. ter in die at first, and later with less amount, 10 grs. ter in die, with result of cure. In one case the blood-coagulation time was reduced in two days from 8 mins. to 2 mins. and 45 seconds.

Itching.—Saville (*Lancet*, August 1, 1896) expresses the view that itching is either primary or secondary, no eruption being present in the former variety—the latter, however, being accompanied by or succeeded by some form of eruption—*e.g.*, "eczema." The secondary form may be explained by the involvement of the terminal nerve fibres in the lesion of the skin. The explanation of primary itching is probably to be found in some blood change, in proof of which statement it may be noted that it is usually generalised in distribution, and varies in intensity from time to time, often from hour to hour or day to day. Certain articles of food cause it or aggravate it. In certain forms of itching, such as that met with in diabetes, gout and jaundice, changes in the blood are known to occur, and morphin introduced into the blood gives rise to itching. Upon these grounds Saville administered large doses in primary and secondary itching, and with success. Large doses often succeeded where smaller ones failed, and in the large number of cases in which it was tried there was no absolute failure. The dose was never less than 20 gr. ter in die, largely diluted with water, after meals.

Paroxysmal Hæmoglobinuria.—Sweet (*New Zealand M. J.*, 1896) reports a case which was apparently caused by sudden exposure to cold water in bathing, and which subsequent

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examination showed, in his opinion, to be due to cold, as the blood of a ligated finger which had been exposed to freezing was greatly disintegrated, and not unlike that found in the urine. The case, however, improved permanently upon the administration of 15 gr. of quinine with $CaCl_2$ ter in die.

Tuberculosis.—W. Murrell (*Medical Brief*, July, 1897) uses $CaCl_2$ in large doses in tuberculosis, in the hope of aiding calcification. This treatment is combined with phosphates of lime to replace the loss of phosphates, and with hyperphosphate of lime in large doses.

Oozing Hæmorrhage.—Hare (*Columbus Medical Journal*, 1898) calls attention to the value of $CaCl_2$ in the treatment of small oozing hæmorrhages. Wright, of Netley, as is well known, pointed out some years ago that the use of $CaCl_2$ distinctly increases the coagulability of the blood, and he also pointed out a fact which must not be forgotten—namely, that after the drug has been given in full dose for a number of days a reverse effect is produced. Its use should not be persisted in for too long a time.

The hope that $CaCl_2$ might prove of value as a substitute for KI in the treatment of aneurysm has not been fulfilled.

The fact that cases of prurigo were frequently attended with erythematous or urticarial exudations, led Wright to infer that there was a tendency in the blood in such cases to exudation, and therefore to increased fluidity. Consequently, whatever would increase the coagulability might, he thought, relieve the troublesome itching.

The favourable results attending his first four cases induced him to try it more extensively, and in almost every case, we are told, the effect was very striking.

Since 1896, when the remedy was first suggested, it has been used by many observers in a variety of skin diseases associated with itching, the result being quite variable.

The question of dose is important—40 to 60 gr. daily for

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two days are generally sufficient. "The effect on the blood appears to persist after it has been discontinued."

Mitchell Bruce.—Highly recommended as a specific in scrofulous enlargement of the glands.

Neligan, "MacNamara."—$CaCl_2$ acts as an irritant poison in large doses. In medicine it was at one time much employed in the treatment of bronchocele and in scrofulous diseases, being given internally, and, at the same time, used externally dissolved in water in the form of a bath. Its action is said to be tonic and deobstruent, by others cathartic. In the present day, however, it has fallen into disuse, although lately proposed by M. Cazernave as a remedy for lupus, eczema, and impetigo. This salt forms a principal ingredient in many mineral waters.

Squire, 1899.—Alterative and deobstruent, given in glandular enlargements, especially those of tubercular origin, it increases the coagulability of the blood, and is, therefore, used in gastric and intestinal hæmorrhage internally, also for chilblains; given in pneumonia and hæmophilia.

Whitla, 1885.—Is recommended in scrofula and tubercle in 10-gr. doses. It acts as a restorative, and has been recommended in rickets and ailments of defective nutrition. Madden believes it may cause the absorption of uterine tumour by inducing calcification. In large doses it is an irritant poison.

Hale White, 1898.—Outside the body it increases the rate of coagulation in the blood, and has, therefore, been recommended for hæmoptysis and other forms of hæmorrhage, and also for aneurysm, but it has not been proved to be of much service. It is, however, probably useful in hæmophilia. It used to be given with the object of reducing enlarged lymphatic glands, but is not now employed.

Dr. Walter Smith said that, with regard to the absorption and excretion of calcium salts, one ought to draw a distinction

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between inorganic and the organic salts such as were found in milk and in the yolk of an egg. The introduction of such a preparation as Dusart's syrup was an indication that an organic compound was believed to be more readily absorbed than the ordinary chemical salts. Calcium salts were absorbed from the whole tract of the digestive canal, but especially from the stomach and small intestine. In the intestine they were absorbed as an acid phosphate, or as an acid albuminate of calcium. Only one channel of excretion was dealt with by Dr. Falkiner, but it was quite certain, from a number of investigations, that of the total calcium ingested only about 5 or 6 per cent. was excreted by the urine, leaving the rest to other channels, principally the bowel. Only a few years ago it was proved beyond doubt that about 22 per cent. of calcium salts, administered when the small intestine was ligatured, was excreted into the large intestine. It was fallacious to try to determine the amount of lime absorbed by analysing one excretion; and, moreover, the amount of lime in the food taken should be also ascertained. The administration of inorganic acids with calcium salts undoubtedly favoured their absorption, alkalies, on the other hand, delaying their absorption; experiments on these points were conclusive. In one important disease, diabetes mellitus, there was an increase in the excretion of lime, and it had been pointed out that the bones of diabetic patients were lighter than others, due to their impoverishment in lime salts. An interesting point of contrast between calcium and its chemical ally, magnesium, was, as one would expect from its therapeutical action, the quick absorption of the latter as compared with the former. Sixty per cent. of the magnesium salts was excreted in the urine, and 40 per cent. in the fæces; whereas, in the case of the calcium salts, more was excreted by the bowels than by the urine.

Sir J. W. Moore, Dr. Travers Smith, and Dr. Knott then spoke.

Dr. Stapleton said that when acting recently as House Surgeon in a London hospital an operation was performed for varicose veins, and the patient, a boy, turned out to be a bleeder. The evening of the operation he complained of great pain, and on examining the leg they found a very large hæmatoma. They put him on calcium chloride, 10-grain doses thrice daily, with most beneficial results.

Dr. Parsons and Dr. W. J. Thompson also spoke.

Dr. Falkiner replied.

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NOTES ON THE DOSES OF THE ARSENIUM COMPOUNDS OF THE BRITISH PHARMACOPŒIA.

By NINIAN FALKINER, M.D. Univ. Dubl.; F.R.C.P.I.;
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[Read in the Section of Medicine, March 8, 1901.]

Mr. M'Kenna, Clinical Assistant to the Liverpool Skin Hospital, in the table, and his interesting remarks which were published on page 85 in the number of the *British Medical Journal* of January 12th, has suggested to me the investigation of the ratio of the doses of the official compounds of "arsenium" to the percentage amount of arsenium in each compound.

The following table shows in—

Col. 1.—The percentage of arsenium in each compound.

Col. 2.—The approximate strength in As of equal weights of (*a*) As_4O_6, (*b*) Na_2H (As O_4), (*c*) Fe_3 (As $O_4)_2 4H_2O$, (*d*) As I_3.

Col. 3.—The minimum dose of each compound as given in B. P. expressed in decimal parts of a grain.

Col. 4.—The minimum dose that should be given of each compound, calculated from the minimum dose of As_4O_6 (as laid down in the B. P. of 1898), on the basis of the percentage of As that the compound contains.

Col. 5.—The number of minims of the official liquors that contain each a minimum dose of the compound as calculated in Col. 4.

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—	Col. 1 —	Col. 2 —	Col. 3 —	Col. 4 —	Col. 5 1·6 ♏ Fowler's Solution
As_4O_6 - -	75·77	4·5	·016	·016	1·6 ,, De Valangin's ,,
$Na_2H\ As\ O_4$ -	40·03	2·4	·025	·030	3·0 ,, Pearson's ,,
$Fe_3(As\ O_4)_2 4H_2O$	28·96	1·6	·062	·045	—
$As\ I_3$ - - -	16·5	1·0	·052	·072	7·2 ,, Donovan's ,,

Two points arise, however, in the consideration of the dosology of the arsenium compounds from this standpoint—1st, the question of solubility; and, 2nd, the relation between the chemical constitution of a compound and its pharmacological activity. The first point may arise with reference to the dose of $Fe_3\ (As\ O_4)_2 4H_2O$, and the second point does not appear to have influenced the calculations of the dose of $Na_2H\ As\ O_4$, as its dose is less than it ought to be, if calculated on its percentage of arsenium, while, according to the view that unsaturated compounds are more physiologically active than saturated, the arsenious compounds should be more active than arsenic. The tables bring out the fact strikingly that weight for weight As_4O_6 is about 4½ times as strong as $As\ I_3$ in the quantity of As that it contains, which may account for the tolerance, to a certain extent, which has been observed by Mr. M'Kenna and other practitioners in the use of Donovan's solution. It may be observed that his cases 1, 4, 11, and 25, in taking ·409 grains ($As\ I_3$) daily, were only taking about the equivalent of ·09 grains (As_4O_6).

Dr. Walter Smith observed that there was a great gap, in the case of arsenic, between its reputed medicinal uses and its known physiological action, as was also the case with respect to mercury. Amongst skin diseases remarkably influenced by arsenic (and he admitted that its use was empiical) he would put at the head of the

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list pemphigus, then that most distressing complaint, lichen planus; and in the third and last place he would put psoriasis. He directed attention to the curious contrast that there was in their knowledge of the physiological action of inorganic bodies as a group as compared with organic. Organic chemistry had made such brilliant advances of late as to put inorganic chemistry completely in the background. At present he did not see any correlation between atomic weights and physiological action. Arsenic belonged to a well-defined group of elements—namely, the pentads—which started with nitrogen. Taking the members of this group, there were very interesting physiological alliances between them, not only in their acute toxic effect, but also when given in small medicinal doses and in chronic poisoning. They all act as poisons to the central nervous system, cause fatty degeneration of the organs, and have a remarkable stimulating effect in promoting the growth of connective tissue, especially of bone, hence the osteogenetic effect of phosphorus and arsenic, and their use in rickets. Referring to chronic arsenical poisoning, he had often given $\frac{1}{30}$ gr. of white arsenic per diem, which came to 2 grs. per month, or 20 to 30 grs. in a year; yet he had never produced chronic poisoning after using it for months. Dr. Falkiner had under-estimated the amount when he mentioned $\frac{1}{4}$ gr. per gallon as found in beer in England, for up to 1 gr. per gallon had been found. He believed that, with regard to arsenic, iron, or mercury, it was all the same what compound they employed provided they took into account simple facts such as solubility, local irritation, absorbability, and soforth.

Sir George Duffey said that Dr. Falkiner's calculation was based solely on the element arsenium, but it was recognised, he thought, by most pharmacologists that arsenious acid and its salts were much more poisonous than arsenic acid and its salts. The point he wished to lay stress on was that the element, arsenium, was not to be taken so much into account as the nature of the salt employed.

Dr. Travers Smith spoke.

Dr. Croly referred to a preparation he was familiar with, called Neligan's solution, which was a solution of arsenic, iodine, and iodide of potassium. It was useful in certain cases where Donovan's solution, on account of the mercury in it, was undesirable. He had given it a long trial, and he remembered inveterate cases of psoriasis that had been cured by it.

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Dr. Craig said he was accustomed to give large doses of arsenic in three affections—first, in pernicious anæmia; secondly, in leucocythæmia and allied affections; and thirdly, in nervous affections, more particularly chorea. He referred to a wonderful cure of a case of pernicious anæmia, which he reported some years ago, by 15-minim doses of Fowler's solution thrice daily. The patient presented himself a couple of months ago suffering from bronchitis, and he had taken large quantities of arsenic during all that time, having got the prescription made up regularly at the chemists. He had never seen any evil results from its use in children with chorea, and he had no faith in small doses. In a case of leucocythæmia, which he had treated with 15-minim doses of Fowler's solution thrice daily, the spleen got small, to become enlarged again the following year. The man eventually died of general tuberculosis, which struck him as a peculiar termination, inasmuch as arsenic had been advocated in phthisis, as well as in chronic rheumatic arthritis, on account of a supposed germicidal action.

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NOTES ON SOME STOMACH CASES.

By WILLIAM CALWELL, M.A., M.D., M.Ch. R.U.I.;
Consulting Physician to the Ulster Hospital for Women and Children, Belfast;
Physician to the Royal Victoria Hospital, Belfast, and Throne Consumption Hospital.

[Read in the Section of Medicine, April 12, 1901.]

A few years ago I attended Nurse B. for anorexia and dyspepsia. The symptoms were such as led me to suspect the existence of a case of anorexia nervosa. She improved, however, somewhat, and was sent abroad as companion to an invalid. In 1897 she had one of the most sudden and severe attacks of hæmatemesis I have ever seen; however, she again rallied, and finally was able to perform some of the less laborious duties of a nurse, and perhaps, if not actually to enjoy life, at any rate to enjoy fairly good health as long as she observed great care in her diet and avoided active exertion or fatigue. On the last day or so of February and on March 1st, 1898, she had slight twinges of pain, and on the 2nd acute perforation took place, apparently while in a bath, to take which she had left the supper table earlier than usual. I obtained her consent, and she was operated on in about five hours by Dr. Mitchell. Some of the gastric contents were extravasated. There were extensive strong adhesions to the diaphragm on the anterior surface close to the lesser curvature, and the appearance of the perforation gave me the impression of a tear. She died in about 18 hours. There was marked induration around the seat of lesion.

On the 30th of November, 1898, I examined a patient at the request of Dr. Mitchell, and was present at the subsequent operation for perforation. In her case, too, the perforation

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was on the anterior surface, close to the lesser curvature, and there were adhesions to the under surface of the liver.

On the 28th of November a maidservant, aged nineteen, was admitted under me into the Royal Hospital with a history of ulcer for a year or so, and with signs of perforation, although these were not of a very severe nature; the pulse was under 90. I procured the services of Professor Sinclair, who operated, and found adhesions, with a little extravasation, still encapsuled, from a perforation near the cardiac end of the lesser curvature. She made an excellent recovery.

On the 16th of February, 1899, I examined—and was present at the subsequent operation—a female, aged thirty-two, with the history of ulcer for years, suffering from perforation; it was on the anterior surface, near the lesser curvature, and three inches from the pylorus; there were firm adhesions. She recovered.

On the 14th of November, 1899, I examined—and was present at the subsequent operation—a female, aged twenty-two, suffering from perforation, surrounded by an indurated area on the anterior surface, near the lesser curvature; there were firm adhesions. She recovered.

On the 19th of November, 1899, I was present at an operation by Professor Sinclair for perforation; there were old adhesions.

On the 5th September, 1900, I saw Miss O., aged twenty-seven, in a hotel in Belfast, in consultation with Dr. Richard Purdon. The young lady belonged to Yorkshire and was touring in Ireland. She had been troubled with her stomach for many years, vomiting after food; no hæmatemesis. She left Larne in the morning and came to Belfast, feeling some pain; however, she started out to do some sight-seeing, but had to return to the hotel. She timed the sudden intense pain at 4 30 p.m. Dr. Purdon saw her about 6–7 p.m.; I saw her at 7 30 p.m., and supported him

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in his diagnosis, and in the necessity of immediate operation for perforation; but both her friends were not to be in till late. However, we had her removed to hospital in the ambulance, and on her own consent being given, Dr. Mitchell operated, and found a perforation, old and recent adhesions, and a ring of hardened, thickened tissue. She made an excellent recovery, with the exception of a left pleurisy, which I aspirated, and took away nineteen ounces of clear fluid.

Not very long ago I saw another case of perforation in a woman over thirty, with a history of some years of trouble. There were extensive adhesions and a ring-like induration. As there was considerable extravasation—due to the length of time from the moment of perforation to the operation, and also due to a four-mile drive in a cab—there was little hope of success from the beginning, but it was thought better to give the patient the very little chance there was.

These are the very short and inadequate notes of the cases of perforated gastric ulcer which I have seen operated on; some were under my own care; in most I had some responsibility in the diagnosis and in the recommendation for immediate operation. I desire to point out the chronicity, the invalidism, the extensive adhesions that were a common feature in nearly every one.

I now come to the next series. The first is Dr. Tennant's (as reported in *The British Medical Journal*):—

"ULSTER HOSPITAL FOR WOMEN AND CHILDREN, BELFAST.

"*Abdominal Section for Adhesions of Stomach.* By John Tennant, M.A., M.B. Edin.

"E. L., aged thirty-nine, was admitted on December 27th, 1899.

"*History.*—She had had good health till 1892, when she had hæmatemesis. Afterwards she had almost constant dyspepsia, but there had been no further hæmorrhage until December 6th, 1899, when, she says, she vomited a quart of blood. Since the latter date she had been in bed, unable to retain solid food, and suffering almost constant pain in the stomach.

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"*Condition on Admission.*—She was pale and emaciated; weight. 5st. 6lbs.; the pulse was constantly over 100, but the thoracic organs and kidneys appeared to be healthy; a tumour as large as a pheasant's egg could be seen and felt in the abdominal wall, immediately to the left of the umbilicus; it was tender and immovable, and came within the area of stomach resonance.

"*Progress.*—During the four weeks following admission her temperature continued to rise irregularly at night; vomiting was frequent and pain almost constant; and her weight decreased by 7lbs. Drs. William Calwell and J. St. Clair Boyd saw her several times with me, and advised operation.

"*Operation.*—On January 27th, under ether, the abdomen was opened through the left rectus abdominis muscle over the tumour. The latter proved to be a thickened and vascular area of the rectus sheath, which was incorporated with the stomach wall, and surrounded by filamentous adhesions. Strong adhesions also existed between the anterior wall of the stomach and the falciform ligament of the liver (which was much thickened), and the lower surface of the liver as far back as the gastrohepatic omentum. The left rectus muscle was divided, and the adherent part of its sheath was cut away and left attached to the stomach. The remaining adhesions to the ligament and capsule of the liver were tied and divided, and the free end of the gastrocolic omentum was brought up and sutured to the under-surface of the liver, to prevent adhesions re-forming, as it was found that the diseased area of the stomach was so thickened and friable as to prevent invagination of the wall. The wound was then closed.

"*After-history.*—The patient made a good recovery from the operation, and was free from pain and vomiting during the remainder of her stay in hospital. She was discharged on March 14th, at which time she was taking the ordinary hospital diet without discomfort, and weighed 5st. 9lbs. She was last seen in July, when she was still very thin, but free from dyspepsia."

Miss H., aged twenty-nine, was sent to me on the 26th of October. Her stomach trouble started when she was fourteen years old; pain after food, vomiting with relief, &c.—a condition which lasted for ten years. The first blood brought up was about six years ago. About this time, on a very carefully regulated diet and medicine prescribed by a

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homœopath, she improved, and had a year's comparative ease. She gave, without any leading question being put to her, most important information. When she lay down and remained quiet, in the horizontal position, she did not vomit, and could retain with comfort a breakfast or dinner; if, however, she got up two hours after a meal she would vomit it, little changed. Latterly she had been losing flesh and getting very low-spirited, as she had had to give up one or two occupations, and was naturally a bright, active girl. I made out the stomach to be small in size by external examination, and some tenderness three inches below the sterno-xiphoid junction. I desired to inflate the stomach and get the result of a test meal, but she vomited a little blood again a week afterwards, and so I urged, along with my friend Dr. Fullerton, immediate operation, which was performed in a private hospital by Dr. Mitchell. He found some adhesions to the anterior surface, and an hour-glass stomach, with the constriction about the middle; there was much thickened tissue; both sacs were small; he made an opening between the two. She has done remarkably well.

A woman named P., aged thirty-five, was admitted into hospital towards the end of March of this year for stomach affection. She had been in before, but with little benefit. Her history was that for fourteen years she had been troubled with dyspepsia, vomiting, pain, tenderness, occasionally bringing up blood. On physical examination a circumscribed definite area of tenderness, dull on percussion, was made out under the margin of the left ribs, in shape semilunar, about 2 in. radius. The stomach was not dilated, and no test examination made of its digestive functions. On the 4th of April an exploratory operation was performed; the tender region, dull on percussion, was found to be an extensive adhesion to anterior abdominal wall and to under-surface of liver, into which the ulcer had eaten; the stomach was

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practically of hour-glass shape. I am indebted to Dr. Mitchell for permission to use the notes. I did not see the patient till on the operating table, with the viscera exposed.

R. F., aged twenty-eight, was admitted to hospital on the 16th of February, 1901. She had a history of gastric ulcer for seven years, with repeated hæmorrhages during the last four, repeated attacks of great pain, vomiting, tenderness, but occasionally intervals of freedom. In October, 1900, she had an attack of inflammation of the region of the stomach. In former years she was 11 stone in weight; on admission she was only 5 st. 6 lbs. I had seen her previously in consultation with Dr. English, and we both recommended an operation, sooner than let her slowly die of starvation and exhaustion from pain. On physical examination a very tender semi-lunar area was discovered below the left ribs, with its centre about opposite the end of the 9th rib, dull on percussion, giving one the impression on palpation of an ill-defined tumour. There was visible peristalsis of the intestine constantly present in the umbilical region. The stomach could not be dilated. A diagnosis was made of extensive adhesions to the anterior abdominal wall, and the idea of a gastro-intestinal fistula was entertained; the supposition of gastro-colic fistula was not supported by the character of the motions; once the motions were distinctly melæna. An exploratory operation was performed by Mr. Kirk; the adhesion to the anterior parietes was enormously thick; there was an adhesion to the colon, but no fistula; the stomach was freed from the former, partly by cutting away, partly by tearing; but, owing to the weak condition of the patient, Mr. Kirk decided not to do any more. The presence of an abscess had been suspected—as the leucocytes were found to be 18,000—but none was found. She has slowly recovered some strength, putting on a little flesh, and eats practically anything. However, I regret to say that within the last few

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days she developed influenza, and there are signs of a little fluid in the right pleura—probably tubercular.

Miss A., of Belfast, aged twenty-two, consulted me on 8th of January, 1901. Three years ago Miss A. had suffered from inflammation in abdomen; there was great pain below the heart, coming and passing away every six hours or so; she was confined to bed for a month, with great pain and tenderness, and if she moved she would vomit; she heard the doctor in attendance say that there was peritonitis about the stomach. She had three similar attacks, making four in all, and several minor twinges. Before this first attack she was perfectly healthy; after the first she was able to go about, and eat nearly anything; after the succeeding attacks her condition was seriously impaired; if she walks, or eats freely, or takes tea, she gets pain, feels sick, vomits, and the vomit is something green; if she lies quietly in bed she is free from pain and sickness; position and movement have more effect than the quantity or quality of the food. On physical examination I made out the stomach as small and pretty full of fluid; some tenderness in epigastrium. I tried a restricted diet and alkaline powder, but with no improvement. I then urged a more thorough examination and subsequent operation, but have not heard of her since.

My diagnosis was—extensive adhesions, with more or less distortion of shape and reduction in size of the stomach.

I had another case in August, 1900, from Bangor, with Dr. Gorman, with a somewhat similar history. Miss A. P., aged twenty-eight; stomach trouble for ten years; pain, vomiting after food up to three or four times daily; intervals of good health, very well in 1894-96. In 1897 she suffered from an attack lasting two months; very severe attack in May, 1900, coming on while out walking. On physical examination there were two large resonant areas—one in the usual position of the stomach, the other adjacent and to the

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right, continuous at lower part with the upper; both gave splashing sounds, which rather upset my supposition that the lower one to the right was the colon; there was considerable fluid in the upper chamber, as evidenced by the lower half of it becoming dull in the erect position; the same did not hold with the lower chamber, which extended down as far as the umbilicus; but on repeated examination I still got splashing; and it was not the shape of colon, of which, perhaps, it might have been a bulging loop. I suspected an hour-glass stomach. There was great tenderness in the epigastrium, adjacent to the border of the left ribs, with centre opposite the end of the 9th. She refused operation.

In the above notes I have given both those in which the diagnosis has been verified by operation, and those in which it has not. They are all examples of extensive adhesions, sequelæ to gastric ulceration, which disable a patient, and do not yield to medicinal or dietetic treatment. Not only is the patient a confirmed invalid, but the danger of perforation continually hangs over him or her.

I now come to the third series of cases—where the lesion is in the neighbourhood of the pylorus.

A man, aged fifty, was admitted to hospital on 11th of November, 1899, suffering from gastric symptoms. He was first under the care of my senior colleague, Dr. Whitla, but subsequently under my own. As Dr. Whitla informed me, it was palpably a case of dilated stomach. He had suffered for fifteen years with seasonal exacerbations; when in bed at rest he always improved. I found the stomach 2 in. to 3 in. below the umbilicus, with apparently some gastroptosis, as on insufflation with a tube and Politzer's bag, the lesser curvature was below the ensiform, and the pylorus somewhat to the right of the middle line. There was some wasting, but not excessive, and he put on weight while in hospital. I cleared out the stomach and gave him some test breakfasts,

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and on each occasion got well-marked free HCl reaction with Günzburg's test; total acidity, 86; no lactic acid. Relying upon the presence of free HCl, on the improvement while in bed, on the chronicity, I was satisfied I had not to deal with a case of malignant disease, and urged on the patient an exploratory operation, with the object of removing any adhesion that might be causing any pyloric stenosis, or any operable cause, or at least of doing a gastro-enterostomy. He consulted his friends and declined, meeting me with the stiff argument that I had nearly cured him. I sent him to our Convalescent Home, where he got worse. One morning he vomited and became collapsed; our house physician found him rallied from the collapse, but with pain and tenderness in the epigastrium; pulse, 80; and removed him in the ambulance to the hospital. I saw him at noon; pain and tenderness was more general; pulse, 80; temperature, 99°. I obtained the assistance of Professor Sinclair, and urged operation at once. He consulted his son, a tram conductor, and declined, saying I had cured him before and I could do it again, despite my assurances to the contrary, and my strong remonstrances. He died five days afterwards of acute peritonitis. At the *post-mortem* examination we found large and extensive adhesions about the first part of the duodenum to all the surrounding structures. There was an old ulcer with some stenosis of this portion of the duodenum, and some pouching on the proximal side. It would probably have been impossible to have relieved the adhesions, but as the patient was perfectly healthy in all other respects, it would have been a typical case for gastro-enterostomy.

Wm. J. M'W., aged fifty-eight, was admitted to the Royal Victoria Hospital on February 9th, 1901. He had been suffering for twelve years with his stomach, occasionally vomiting, sometimes in large quantities. About one year ago he began to feel pain, severe, but apparently with no relation

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to food; it was somewhat relieved by the prone position, and at times was accompanied by vomiting; attacks of this pain would last two to three days; there were intervals of two to three weeks of immunity from gastric trouble. He had lost three stone in weight in the last year. There were other symptoms of dilatation of stomach. The pulse was 60, artery thickened, slight irregularity, apex beat just outside nipple line, somewhat heaving impulse; some albumen in urine. On inspection the peristaltic waves of the stomach could at times be seen. His stomach was washed out at night, and a test breakfast administered in morning; free hydrochloric acid reaction was very marked; this result was manifested on two occasions. On distension the stomach was found to be large, but not below the umbilicus.

The diagnosis of pyloric or duodenal stenosis was made, in all probability non-malignant, and operation was proposed, but declined.

The points to be emphasised are—

1. The long duration of dyspeptic symptoms.

2. The rather rapid deterioration during the last year, suggesting the onset of malignant disease intervening on cicatricial contraction after ulcer.

3. The question of operation on a man of fifty-eight with the condition of heart, kidney, and arterial system that was present.

Matthew J., aged fifty-three, was admitted to the Royal Victoria Hospital on 23rd of March, 1901. He had enjoyed good health till nineteen months ago, and never suffered from any stomach trouble till then. While at his work, about this time, he imagines he strained himself, got weak, and brought up some blood.

For past seven months he has been troubled with pain, vomited at times, sometimes a little blood; he has lost two stone in weight. On physical examination the stomach is

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found greatly dilated; by the gas method it reaches 2 inches below the umbilicus, by the water method 4½ inches below it, an inch or so above the pubis. A test breakfast has twice given a reaction of free HCl, absence of lactic acid; Töpper's method gave total acidity 80, free HCl 20.

This patient was operated on, but unfortunately died from ether pneumonia; a large chronic ulcer was found extensively adherent to the pancreas; the ulcer was very close to the pylorus, which, however, was not stenosed, but the pyloric ring was thinned; the operation was successful as far as the condition of the wound was concerned.

In considering these cases we see we have—first, perforation of a chronic gastric ulcer; secondly, marked and extensive adhesions in the site of an old gastric ulcer, which interfered with the patient's health; thirdly, dilatation of the stomach due, certainly in one case, very probably in another, and possibly in the third, to cicatricial contraction of an ulcer. In the second division the stomach was becoming hour-glass shaped.

The first point I should like to emphasise is in connection with perforation. In all my cases the ulcer was chronic; the time of suffering was years. I have had several cases of hæmatemesis from acute ulcer, and unfortunately two deaths. In one I obtained a *post-mortem* examination, and the ulcer was no larger than a sixpence, but had eaten into a large vessel which ran straight through the base of the ulcer; but I have not seen perforation in an acute ulcer.

Again, there were extensive adhesions and localised peritonitis in the region of the ulcer to the liver and anterior abdominal wall; there was also extensive thickening and induration in the wall of the stomach. The questions that present themselves to my mind are—first, were the symptoms for some time previously due to an ulcer, or to the chronic induration and the adhesions; secondly, was the perforation really a perforation, and not a tear—in Nurse

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B.'s case it looked very like the latter, and the history of it coming on while in the bath rather supports this theory; a history of sudden exertion is very common. I have endeavoured to persuade my surgical colleagues to inspect the mucous membrane in all these cases; a bright light, a powerful head reflector, and a laryngeal mirror, with a slightly enlarged opening in the stomach, are sufficient. But the most important question of all is this—"Can we not anticipate this condition of affairs?" As an answer I give my present provisional prophylactic treatments:—

First of all, looking upon gastric ulcer and chlorosis as more or less developmental diseases, I endeavour to warn all young women of fifteen to twenty-five of the extra liability they run, and to emphasise the necessity of extreme care; secondly, all cases of chlorosis and of dyspepsia at this time of life are treated as serious, and both are put to bed till all dyspepsia disappears and their chlorosis is improved—iron is to be continued for three months, with courses of the same drug for several years; thirdly, suppose a case of dyspepsia with symptoms of relapsing gastric ulcer has lasted for two years, and a prolonged rest in bed with regulated diet has proved unavailing as a permanent cure, I advocate an exploratory laparotomy. A gastric ulcer will heal, unless prevented by bad treatment, adhesions, or induration. The adhesions that form are no preventive of a perforation; they impair peristalsis and digestion, they promote catarrh, they give rise to pain, and they constitute a continual source of danger.

There is, in short, a type of dyspepsia which I venture to call the "adhesion type;" for some months it often follows attacks we deem to be ulcer of the stomach; it also occurs independently of any clear history of ulcer.

The symptoms pointing to "adhesion dyspepsia" are—

1. A history of gastric ulcer, or of some inflammatory

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condition in the neighbourhood of the pylorus, particularly of localised pain and tenderness.

2. Freedom from dyspeptic trouble while in bed, or while at rest with easily-digested foods.

3. The pain being of a dragging nature, and relieved by rest, but increased by exertion.

4. Frequently a history of a sharp, shooting pain on sudden exertion or stretching, such as lifting up a picture; and the intuitive avoidance of certain movements, and of heavy meals.

5. Some comfort from a fairly tight abdominal bandage.

6. The general health is good and appetite is fair, but the patient is afraid to eat.

When perforation occurs of course the way is clear; there is no doubt then that in immediate operation lies the only chance of life. I advocate that we should anticipate this compulsory action, provided that we are satisfied that rest, diet and medicine, with a reasonable time limit, is ineffectual. It is our duty not to let the patient drift about from doctor to doctor, but to explain clearly the necessity of an exploratory operation. The percentages of success then would be comparable with that for relapsing appendicitis during an interval, not with that during an acute attack.

The cases where there were large adhesions and disfigurement of the stomach come under the same category.

The cases, however, where there was dilatation of the stomach are open to question. In one, an operation should have been undertaken years before; in another, the symptoms were perhaps too slight, and the cardio-vascular and kidney condition was not such as to warrant one in urging exploration. In the third, an operation is advised although the diagnosis is not so clear; but whether malignant or not, a gastro-enterostomy would bring much relief.

In cases of chronic dyspepsia in the young female we must

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endeavour to distinguish four common, but most important and distinct, causes—

1. Chronic dyspepsia kept up by ingesta of an injurious nature; here want of veracity on the part of the patient may deceive the very elect. This should in all cases be carefully gone into.

2. Hysterical neurosis; here practically one most important clinical fact stands out. No organic disease exists which is not promptly and considerably relieved—at any rate temporarily—by suitable treatment carefully carried out. In hysteria your specially prepared peptonised milk, and your compound nutrient enemata and rest in bed, are all thrown into discredit. An exploratory operation in such cases should only be undertaken after isolation and massage has been given a fair trial.

3. The presence of ulcer without the usual signs—*e.g.*, hæmatemesis, &c. This is a most difficult and treacherous state of affairs. The full "ulcer" treatment should be adopted with severity for three weeks, then massage and isolation; finally, an exploratory laparotomy.

4. A nervous type of dyspepsia from brain exhaustion and worry. These cases are often made worse by low diet and a gloomy prognosis; a good holiday acts like a charm; the acute forms seem to be more or less complicated by actual catarrh.

5. Hyperchlorhydria. I am not satisfied as to the existence of such an affection independent of ulcer.

A girl, aged about twenty years, was admitted under me for gastric ulcer; she had been in hospital before under the late Professor Cuming with the same complaint. There was a history of hæmatemesis, but it was after a clinical lecture had been delivered. I tried cooked diluted milk, with variable results; then farinaceous diet, then animal soups, cleared, then only teaspoonfuls of warm water, and nutrient enemata.

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Some mornings she was better, some not so well, sometimes tender, sometimes not. I fell into the trap, and gave the diagnosis of chronic gastric ulcer, with adhesions and thickening, and asked my friend Dr. Mitchell to explore. A perfectly healthy stomach was found; the mucous membrane was not explored; curious localised spasms of the stomach wall were observed rendering areas about the size of half-a-crown hard, white, and bloodless. The spasm passed away in about ten to twenty seconds.

In venturing to read these notes, my desire is to uphold the following principles:—

1. That the general practitioner is too apt to overlook the mechanical causes of chronic dyspepsia, to disregard the chronic sequelæ of gastric ulcer.

2. That these are often remediable by operative measures.

3. That careful examination can often lead to a fairly accurate diagnosis.

4. That as physicians it is our duty first to prevent, then to remedy, but scarcely ever to abandon as utterly hopeless.

Professor McWeeney said for the last year or so he had tested the vomit from suspected cases of gastric cancer for hydrochloric acid in the Mater Hospital, and the indication given by its absence was, in the main, found to be correct. Originally he had placed no faith in this test, but his recent experience induced him to alter that opinion. He referred in these remarks to matter taken from the stomach as a result of a test meal.

Dr. Parsons said the first case by Dr. Calwell recalled to him the first case of perforation coming under his immediate care. The patient was a nurse, and had been suffering for some years previously from gastric symptoms, and it was thought probable that she had anorexia nervosa, which diagnosis was supported by the fact that she obtained considerable relief from the use of certain coal-tar derivatives, more especially antipyrin. She had never suffered from hæmatemesis, and though she had a good deal of pain it did not interfere with her duties. Operation was per-

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formed soon after perforation, and she died in about six days. At the operation they found a dense ring of induration round the margin of the perforation, and the ligatures cut through, so that they could not close the opening, and finally the stomach had to be stitched to the anterior abdominal wall. If one found, in addition to diminished hepatic dulness and collapse, a pulse steadily increasing in frequency, he looked upon the last as a danger-signal in cases of suspected perforation. With regard to the third group, with pyloric obstruction, he had some experience of those cases, and one of the first he had met was that of a woman who had had an abscess opened previously in the 7th intercostal space, but whether the pus came from above or below the diaphragm the surgeon was unable to decide. She came to him afterwards with dilatation of the stomach, and he could feel a large dense mass in the right hypochondriac region. The presence of hydrochloric acid in the vomit led him to conclude that there was cicatricial contraction, and that the large mass was a mass of fibrous tissue. A gastro-enterostomy was performed by Mr. Croly, but death ensued. An autopsy confirmed the diagnosis, the fibrous tissue completely occluding the pylorus, so that a No. 12 catheter could with difficulty be admitted. On the subject of Professor McWeeney's remarks he (Dr. Parsons) found an absence of hydrochloric acid in many non-malignant cases, and he recalled one case in particular in which the patient, a girl, died of Addison's disease. He considered, however, that its presence was of greater diagnostic value, as he had never found it present in the case of cancer, except once, and that was a very doubtful case.

Dr. W. J. Thompson said that last year he brought forward a case in which there were all the symptoms of acute perforating gastric ulcer, but on operation there was no sign of gastric ulcer to be found. A case came under his care about two weeks ago, in which the patient, prior to the last attack, showed no symptoms of gastric disturbance, and still on operating a large perforating ulcer was found. The patient was a blacksmith, thirty-five years old, who had been previously strong and healthy. On leaving work in the evening he was attacked with a sudden pain over the region of the appendix, which became worse during the night, and in the morning he was suffering from well-marked peritonitis and pain, particularly over the region of the appendix. He stated that he never had gastric disturbance, and that the only thing he used to suffer from was constipation. On operation the appendix was

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found to be perfectly healthy, but there was a large perforating gastric ulcer. He died two days afterwards. The ulcer seemed to him to be due to an embolus or thrombus.

Sir John W. Moore said he was attending a middle-aged gentleman about six months ago who had all the symptoms of ulceration, at all events of the duodenum, if not of the stomach. The diagnosis which he had arrived at was that he had a peptic ulcer. An eminent consultant remarked to him that this patient was doomed, as he heard that he had carcinoma of the stomach. The patient was now better, and was out working in his garden, and progressing fairly well. He was, therefore, sceptical about the diagnosis of carcinoma, considering, further, that this diagnosis was made twenty years ago, and that there was plenty of hydrochloric acid in the vomit.

Dr. Calwell, replying, said he had not dealt with the diagnosis, as it did not come under the heading of his paper. As far as his experience went, hydrochloric acid was absent in cases of cancer. With regard to the increasing pulse rate in perforation, one of his patients had a pulse of 80 for two or three days, which was confusing, but other symptoms, especially the expression, convinced him of the fact of perforation.

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NOTES ON SOME UNUSUAL PULMONARY CASES.

By JAMES ALEXANDER LINDSAY, M.A., M.D. (R.U.I.);
Professor of Medicine, Queen's College, Belfast;
Physician to the Royal Hospital, Belfast.

[Read in the Section of Medicine, April 19, 1901]

SYLLABUS OF CLINICAL CASES.

1. Case of malignant disease of the lungs, with purulent infiltration; malignant deposits in various viscera—Death and autopsy.
2. Case of malignant disease of the lungs, simulating phthisis—Death.
3. Case of malignant disease of the lungs, with obscure physical signs—Death.
4. Case of sub-phrenic abscess, rupture into left pleural cavity, broncho-pleural fistula—Recovery.
5. Case of pyo-pneumothorax, with broncho-pleuro fistula—Recovery.
6. Case of double pneumonia, with delay of crisis to the 20th day—Recovery.
7. Case of plastic bronchitis—Recovery.

CASE I.—Esther G., aged forty-six, married, was admitted to the Royal Hospital upon September 8th, 1900.

The history was that she was in good health until June 20th, when she took ill with vomiting, pains in back, sides, and abdomen, shortness of breath, cough, and expectoration. She obtained relief under treatment, but early in August her symptoms returned, and she was confined to bed for a fortnight. She again improved, but her condition continuing unsatisfactory, she was admitted to hospital upon September 8th.

On the day of admission the patient was weak and feverish. The temperature was 99° in the morning, but rose to 102·6° at night. The pulse was 140, small in volume, and of low tension. There was pain in the chest and dyspnœa. The respirations were 40 per minute.

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On examination there was dulness, diminished vocal fremitus, and absence of breath-sounds over the lower half of the right lung posteriorly. Numerous rhonchi were heard over the chest generally. The abdomen was normal; bowels constipated; the urine had a sp. gr. of 1018, and contained urates; otherwise normal. On the left shoulder there was a firm nodule, about 1½in. in diameter, adherent to the skin. The expectoration was muco-purulent; no hæmoptysis. The patient did not improve, the temperature rising at night to 102°–3°, and falling in the morning to 99°–100°, the general condition being poor. The question of tuberculosis was considered; but an examination of the sputum, which was abundant, demonstrated the absence of bacilli.

Several attempts were made to discover fluid in the right pleura, but without success. On October 10th an examination of the blood showed a well-marked leucocytosis, and a reduction of the red corpuscles to less than half the normal. The temperature continuing hectic, and the patient emaciating, it was considered probable that some focus of suppuration existed; but it was not found possible to determine its situation with certainty. The signs in the right chest pointed either to fluid in the right pleura or some peculiarly dense form of pulmonary consolidation, and were not suggestive of abscess, while no evidence of suppuration could be found in any of the other organs.

Meantime the nodule on the left shoulder had increased in size, and two other small nodules were discovered in the abdominal wall. The possibility that these nodules were malignant, and that the obscure pulmonary condition might also be malignant, was considered. The evidence was curiously conflicting. Against malignancy we had the facts of a definite onset, continuous hectic temperature, the absence of hæmoptysis, and the absence of any pressure signs. In favour of malignancy there was the presence of three suspicious nodules, and of signs in the chest which might be explained by the existence of dense pulmonary consolidation. This suspicion was strengthened when subsequently a fourth nodule appeared on the outer part of the left thigh. The temperature still suggested pus, tuberculosis being proved to be absent; but no consistent view of the case seemed possible. Matters went gradually from bad to worse, without any distinctively new development, and upon October 31st, a little over seven weeks from admission, the patient died. The *post-mortem* report was as follows:—

The right lung weighed 1 lb. 13 oz. A large mass of encephaloid

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carcinoma occupied the root, and compressed the lower lobe, which was collapsed and splenised. On squeezing the parts pus oozed out freely from the bronchial tubes. The left lung weighed 1 lb. 3¾ oz. There was an old scar at the apex, and a malignant nodule in the peribronchial tissue.

A small carcinomatous deposit, apparently primary, was found in the wall of the gall-bladder, which contained a gall-stone. Secondary growths were found in the liver, which weighed 4 lb. 5½ oz.; in both kidneys, which were enlarged, and weighed 22¼ oz.; in the mediastinum, and elsewhere.

The following points are noteworthy in this singular case :—

(*a*) The definite onset, following a chill, which happened to coincide with the invasion of various organs by malignant growths.

(*b*) The fact that the symptoms were purely pulmonary, although malignant deposits existed in gall-bladder, liver, kidneys, mediastinum, and other parts.

(*c*) The absence of some of the most characteristic signs of malignant disease of the lungs, such as hæmoptysis, evidence of pressure, &c.

(*d*) The co-existence of purulent infiltration of the lungs, setting up hectic fever, and giving rise to a train of misleading symptoms.

Case II.—Thomas S. (twenty-one) was seen by me upon August 21st, 1899, in consultation with Dr. Forsythe, of Coleraine. The patient was suffering from persistent hæmoptysis, with cough, weakness, loss of flesh, pyrexia, and pains in the right leg and in both wrists.

The history was as follows:—Upon November 5th, 1894, the patient had had his left leg amputated for osteo-sarcoma at the knee-joint. He had remained well until the spring of 1899, when he began to show signs of failing health, and occasionally he coughed up a little blood. He consulted Dr. Forsythe upon May 16th, when some dulness and crepitation were discovered in the right lung; the temperature was febrile, there were night perspirations, and subacute rheumatism of various joints was present. The

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expectoration was often blood-stained. He continued to lose ground during June, July, and August.

At the date of my visit (August 21st) the patient was very weak, and was with difficulty moved in bed. There was profuse and persistent hæmoptysis, the blood coming up easily, and being mixed with much watery mucus. The hæmoptysis had persisted for many weeks, and had proved uncontrollable. There was much pain in the chest. On examination, patches of dulness and crepitation were discovered in the right lung. These patches were most evident posteriorly, and were present in the upper and middle portions of the lung, the apex not being affected.

The diagnosis evidently lay between phthisis and secondary sarcomatous deposit in the lung. We decided in favour of the latter alternative on the following grounds:—(1) The history of antecedent sarcoma, (2) the persistence and uncontrollable character of the hæmoptysis, (3) the distribution of the physical signs in the right lung, these being diffused, and the apex being unaffected, (4) the absence of bacilli from the sputum, bacteriological examination having failed to demonstrate their presence.

The case progressed unfavourably, and the evidence of malignant deposit became clearer. The right lung became solidified, and pushed down the liver. The left lung became involved. After a time the hæmoptysis ceased, and the expectoration consisted of ropy mucus, which flowed into the patient's mouth without coughing. Emaciation continued, and the patient gradually sank until his death upon October 19th. For a week prior to death the temperature was normal. It had been pyrexial throughout the greater part of the case, the average range being 100° in the morning, and 101°–2° in the evening.

No autopsy was obtained.

While this case might admit of argument, the positive exclusion of tuberculosis being difficult, I think the diagnosis of malignancy was justified by the progress and later symptoms of the case. The chief points were the distribution of the physical signs, the absence of bacilli, and the pressure symptoms which arose towards the close. It must be borne in mind that continued pyrexia, profuse sweating, and emaciation, which were all present in this case, although

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more characteristic of tuberculosis, are not unknown in malignant disease of the lungs. The rheumatism, which was a prominent feature of this case, may have had some relation to the pyrexia. Dr. Forsythe informs me that towards the close the patient had the ordinary aspect of a patient dying from malignant disease, and never showed any trace of the hopefulness or comparative remission of symptoms which are so frequent towards the close of a case of pulmonary tuberculosis.

Case III.—Mrs. P., aged sixty-two, was seen by me in consultation with Dr. Stuart, of Ballymena, upon August 30th, 1900. The patient was complaining of cough, shortness of breath, and pain in the chest.

The history was, that upon June 2nd Dr. Stuart had removed the right mamma for scirrhus, and had cleared out the axillary glands. The wound healed in a fortnight, and all went well for six weeks after the operation. The patient then began to complain of shortness of breath and pain in the right chest. At this time the scar and the skin in its neighbourhood were quite healthy, and there was no ulceration or induration. The pulse and temperature were normal, and no physical signs of pulmonary invasion could be detected. Towards the end of August the breathlessness and pain in the chest increased. There was a slight cough, with frothy expectoration; no hæmoptysis; morning temperature normal, evening temperature about 100°. The physical signs were those of general bronchitis. Although the evidence was not decisive, we came to the conclusion that a secondary malignant deposit was forming in the lungs, that opinion being based upon the advent of pulmonary symptoms without definite physical signs, and upon the amount of dyspnœa and thoracic pain. Shortly afterwards Dr. Stuart detected slight dulness on percussion, with impaired breath-sounds on the right side of the chest in front. There was now some irritation in the scar. The case rapidly went to the bad; dyspnœa, cough, and expectoration increased, and the sputum was tinged with blood. The area of dulness and diminished breath-sounds went on increasing, and extended upwards.

In the last week of her illness the patient suffered from severe dyspnœa, cyanosis, frequent cough, and hæmoptysis. The thoracic pain was less severe. The dull area was now extensive, and

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numerous râles and rhonchi could be heard at the bases of the lungs. The temperature continued slightly febrile in the evenings. There was slight œdema of the neck and right upper extremity, and some enlargement of the cervical and axillary glands on the right side.

The patient died upon September 16th, fifteen weeks after the operation for scirrhus of the mamma, and nine weeks after the first appearance of pulmonary symptoms. No autopsy was obtained.

General Remarks upon Cases of Malignant Disease of Lungs.

1. *As to Physical Signs.*—Much diversity. In Case I. the signs resembled those of pleural effusion; in Case II. they simulated phthisis; in Case III. they were at one stage simply those of general bronchitis. If the physical signs in pulmonary malignancy are at first very obscure, they become clearer as time goes on; an area of dulness and diminished breathing tends to develop, and this area is neither apical nor basic in position, but in the general substance of the lungs or at the root.

2. *As to Symptoms.*—Pain, dyspnœa, and blood-stained expectoration are very important. In one of my cases hæmoptysis was absent. Pressure symptoms may develop and make diagnosis easy, but they are apt to be late in appearance.

3. *As to History.*—This will often suggest the clue. As malignant disease of the lungs is almost never primary, we have the history of pre-existing disease to guide us.

4. *As to Duration.*—Walshe gives the average duration of these cases as 13·2 months. I am inclined to think this may be an over-estimate. My cases, which are, however, too few to justify any positive opinion, would suggest six months as more nearly the average course of a case of malignant disease of the lungs.

Case IV.—Olive M. (twenty-eight), servant, was admitted to the Royal Hospital upon September 30th, 1898, complaining of pain after

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food, weakness and shortness of breath. There was a history of painful dyspepsia, of several years' standing, and of hæmatemesis and melæna. On examination there was tenderness generally over the abdomen, most marked in the epigastrium, and a rectal examination showed that pelvic cellulitis was present. The temperature was hectic, rising to 102°–3° at night, and falling to 99°, and occasionally below normal, in the morning. The pulse was very frequent, the bowels relaxed, and the general state poor. A variety of hæmic murmurs were heard over the præcordium, and the patient was markedly anæmic. The urine contained lithates, but was otherwise normal.

The history and symptoms suggested a diagnosis of gastric ulcer, with secondary inflammatory changes—and probably pus—in the abdomen. There was no history of perforation, and the precise condition could not be determined with certainty.

The patient was examined by some of my surgical colleagues, and the question of laparotomy was considered; but the patient was very averse to operation, and we had no alternative but to pursue a palliative and expectant line of treatment.

The patient's condition continued without improvement from the date of admission (September 30th) until October 27th, although some relief to her sufferings was obtained. During this period the temperature continued high and remittent, and the other symptoms of sepsis persisted.

Upon October 27th the patient suddenly coughed up a considerable quantity of foul-smelling pus, and examination showed that the left side of the chest contained a large quantity of fluid, which proved to be purulent. It was evident that an abscess had ruptured through the diaphragm into the left pleura, and that a broncho-pleural fistula had been established. No improvement followed, and the patient, who positively declined to permit any surgical interference, left hospital by her own choice upon November 4th.

Fortunately, the after-history of the case was subsequently obtained. After leaving hospital "she coughed up enormous quantities of matter" for several weeks, and was much reduced in strength, but after a considerable interval she began to improve, and when examined in the following March she was in fairly good health, the only relics of her illness being some signs of retraction of the left lung. The digestion continued unsatisfactory, but nutrition was fairly well maintained.

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The questions suggested by this case are:—

1. Would operation have been justifiable at the outset of the case? and

2. Would operation have been permissible after the abscess had ruptured into the pleura?

One can hardly resist the conclusion that the patient owes her recovery to a series of happy accidents, which would be unlikely to recur in a similar case.

Case V.—Wilson C. (thirty-six), bread-server, was admitted to the Royal Hospital upon December 9th, 1897, having been previously seen by me in consultation with Dr. Cahill. The patient had been ailing for several weeks, and a diagnosis of purulent effusion into the right pleura had been arrived at before his admission to hospital.

On admission this diagnosis was confirmed, and it was further found that the patient was coughing up considerable quantities of pus, so that it was clear that a broncho-pleural fistula existed. The temperature was hectic, and the general condition very poor. There were the usual physical signs of pyo-pneumothorax. The sputum was found to contain large masses of staphylococci and some streptococci. No bacilli were present.

Upon December 13th an attempt was made to hasten the evacuation of the pus by aspiration, but it was unsuccessful, and it was decided to pursue an expectant line of treatment, reliance being placed chiefly in tonic measures.

For about a fortnight the patient continued in a critical state, but at the end of that time improvement set in and continued satisfactorily. All the symptoms gradually abated, and the patient was discharged upon February 2, 1898, fairly well.

This patient was examined by me a few weeks ago at the expiration of about three years. I found him in good general health and fit for his work as bread-server, which he has pursued without any serious interruption since his recovery. He is a little short of breath, and examination of the chest showed that the right lung had undergone a certain amount of fibroid change.

The question which arises out of this case is—What is the correct procedure to be pursued in cases of pyo-pneumothorax, with broncho-pleural fistula? Is an expectant line of treatment justifiable, and would incision and drainage, which we

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know to succeed brilliantly in empyema, be applicable to these cases?

Case VI.—George H. (six) was seen by me, in consultation with Dr. J. R. Davison, upon New Year's Day, 1901. He took ill upon December 20th with cough and feverish symptoms. On December 22nd signs of left basic pneumonia were detected. For some days the patient's condition continued without material change, the temperature ranging from 103° to 105°, and the general symptoms being severe. Upon January 1st signs of pneumonia of the right apex appeared. At our consultation on the evening of that day consolidation of the left base and right apex was present, and the patient's state was grave, but his strength was fairly well maintained. No change took place until January 8th (twentieth day of the disease), when the crisis occurred, the temperature falling from 103° at night to 99° the next morning, and convalescence was thenceforth uninterrupted.

It is probable that the delay in the crisis in this case may be explained by the supposition that the right apical pneumonia overlapped the original affection of the left base, and so postponed the crisis.

I can recall three other cases of pneumonia in which the crisis was either much delayed or absent altogether. The first was in an elderly patient, who ultimately made an excellent recovery. The second was in a young man who, about the tenth day of an attack of pneumonia, developed general bronchitis—a very unusual event—from which he ultimately sank. In the third case, the absence of crisis was found to be owing to pus in the pleural cavity, which is by no means a rare sequel of pneumonia.

Case VII.—W. M. (twenty-six) consulted me for asthmatic paroxysms. He was very short of breath, much cyanosed, highly nervous, and his digestion was much deranged. The history was, that he had suffered for a long time from attacks of cough and dyspnœa, which were believed to be asthmatic, and that he had taken large quantities of stramonium and similar remedies without much benefit. At first I was disposed to confirm the patient's view of his case, but after a time my suspicions were aroused, and on obtaining a specimen of the sputum it was found to consist

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chiefly of branched casts of the bronchi and mucus. The casts were from ¼in. to 1½in. in length, and varied in diameter from the size of a coarse thread to that of a fine toothpick. They consisted of fibrin, with some cells and crystals.

On the true nature of the case becoming evident, all sedatives were withdrawn, and a tonic line of treatment adopted with some benefit. As, however, it was probable that the patient would not recover in this climate, he was advised to try whether a residence in the interior of Cape Colony would effect a cure. He accordingly went out to the Cape, and spent over three years in the Colony, mainly at Aliwal North. He soon lost all his symptoms, gained three stones in weight, and was able to pursue his professional work as medical doctor. He visited me on his return to this country, when he seemed in all respects in robust health.

This is the only case of plastic bronchitis which has occurred in my practice. The pathology of this condition is still undetermined. It appears to have no affinities with diphtheria. It has been conjectured that it may be due to a micro-organism, but of this there is at present no proof.

Sir George Duffey said the last case (plastic bronchitis) was very rare. He knew only one such case, in a relative of his, and the first symptom was hæmoptysis coming on suddenly.

Sir J. W. Moore and Dr. Travers Smith also spoke.

Dr. Dempsey had a few cases lately bearing on this subject. One of them was an ordinary well-marked pneumonia occurring in a healthy adult. It was an apex pneumonia, strictly limited to the upper lobe. On the 8th day a typical crisis occurred, the temperature remaining down for 1 day, going up again for 3 days, and falling on the 11th. It rose again on the 12th day, and remained up for 2 or 3 days, and about the 18th day became normal. At present he had a patient, a woman of about forty-eight years, and of a rather myxœdematous appearance, with a tumour in the abdomen—he was inclined to think in the colon or omentum. The upper lobe of her left lung was absolutely solid, the breathing over it being faintly tubular. There was no pain, no hæmoptysis, but a little mucoid expectoration. He was not certain that the abdominal lump was malignant, but from appearances he thought so,

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and, therefore, he concluded that the lung was also malignant. The peculiar way it mapped out the upper lobe was remarkable. There were no pressure symptoms. In a recent case of pyo-pneumothorax the patient expectorated a large quantity of pus, and was now at his business, and doing fairly well.

Dr. Doyle had three cases of malignant disease of the lungs, one at present. In all of them extension had taken place from the breast. In the present case there was no hæmoptysis and very little expectoration, but marked pain.

Dr. Lindsay replied.

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CONSTITUTIO LYMPHATICO.

By GEORGE PEACOCKE, M.D., F.R.C.P.I.;
Assistant Physician, Adelaide Hospital, Dublin.

[Read in the Section of Medicine, April 12, 1901.]

The cause of sudden death in young children is, I venture to think, deserving of more attention than has hitherto been paid to it. It is not infrequently ascribed to convulsions, a convenient term no doubt, yet one which only describes a symptom of some morbid state—not the morbid state itself.

The object of my paper is to bring under your notice a condition that as yet has received little notice in this country, and which it is believed has often led to sudden death, especially in young children.

In the *New York Medical Journal* for July, 1897, appears an article from the pen of Dr. James Ewing, of New York, entitled "The Lymphatic Constitution and its relation to some forms of Sudden Death," in which the author says—"Under the term constitutio lymphatica have rather recently been described a series of cases presenting a characteristic hyperplasia of the lymph nodes, spleen, thymus, and often of the lymphoid marrow, associated with hypoplasia of the heart and aorta, and frequently also with rachitis. These pathological conditions have been found, especially in cases of sudden death, from a variety of causes, and are believed by many to indicate in these subjects diminished vital resistance and special liability to sudden cardiac paralysis."

Two cases of sudden and unexpected death had at the time come recently under Dr. Ewing's notice. The first was a girl, aged five years, whose family history revealed nothing of importance, except that a brother two years old showed

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evidence of some tonsillar enlargement, with symptoms of post-nasal adenoids, and also some enlargement of the cervical axillary and inguinal glands; otherwise the child appeared well and in good health.

The previous history was that of a perfectly healthy child, the fatal result occurring during chloroform anæsthesia for an incised wound of the tongue, the result of an accident.

The autopsy made, twenty hours after death, revealed the following conditions:—Heart normal in size, and containing dark fluid blood; aorta of normal size. Lungs—Blood contents considerable; some subplural ecchymosis; bronchi reddened. Thymus measured 7 × 5 × 2 c.m., and covered the upper third of pericardium; spleen slightly enlarged; Malpighian bodies extremely prominent, looking like large miliary tubercles; pulp hyperæmic. Stomach—The solitary follicles, especially about the pyloric end, distinctly visible. Intestine—Throughout the entire intestinal tract, especially in the ileum, the solitary follicles are very prominent; Peyer's patches enormously hypertrophic; the lower lenticular patches measure 11 to 9 c.m. in length, and the enlarged nodules of the lowermost patch appear as distinct polypoid outgrowths ½ c.m. high; the mesenteric nodes much hypertrophied, forming a solid mass of lymphoid tissue quite large enough to have been palpated through the abdominal walls; the tonsils moderately enlarged, but not hyperæmic; the bronchial nodes normal in size; the bone marrow was not examined; no evidence of rachitis; the brain appears normal; the microscopical examination showed hyperplasia of the lymphoid cells, and in the spleen a markedly increased deposit of pigment granules throughout the organ.

The second case was that of a female, aged 27, who died as the result of shock and hæmorrhage in the efforts to deliver a full-term child through a contracted pelvis. The only indications in this case of the constitutio lymphatica were

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the evidences of old rachitis, the hypoplasia of the heart and aorta, and the persistence of the thymus. It is, I think, doubtful if this case should be considered as indicating the presence of the lymphatic constitution, but Dr. Ewing states that the attending physicians were of opinion that the patient's death was inadequately explained by the shock and loss of blood, and the fatal termination was a matter of surprise.

My own observations include a series of four cases, each differing in some points from one another, but all showing a markedly abnormal state of the lymphoid tissue in various parts of the body, and in all cases death was sudden and unexpected.

Case I.—The first case was that of a child who was brought to the Adelaide Hospital in December, 1898. The parents asserted that the child was perfectly well going to bed the previous night, but that on waking in the morning they thought he "looked queer," and immediately carried him over to the hospital, where, on examination, it was found that life was extinct, The child seemed well nourished and cared for, and a very thorough *post-mortem* examination revealed only the following abnormal conditions:—The thymus seemed unusually large, but no exact measurements were made. The mesenteric glands were greatly enlarged. Peyer's patches were very distinct and swollen, and the solitary follicles throughout the entire intestinal tract were so prominent as to give the appearance of grains of sago closely set in the mucous membrane —this condition was most noticeable in the duodenum and jejunum.

Case II.—The second case was that of a boy aged 10 years; he had apparently not been in his usual health for a few days, but was not sufficiently unwell to seek medical advice; he was suddenly seized with an attack that was described as convulsions, and when brought to the Adelaide was found to be dead. The *post-mortem*, as in the previous case, showed that the boy was well cared for. There was slight congestion of one lung. The mesenteric glands were enlarged. Peyer's patches and the solitary follicles prominent and swollen. All the other organs healthy. There is no note taken of the condition of the thymus, so I presume it was, at any rate, not very large.

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Case III.—The third case was that of a child who had been under the care of Dr. Beatty and Mr. Gordon for a nævus on the lower lip. Electrolysis had been used on several occasions under chloroform, and it is a matter of congratulation that the fatal result did not occur on any of these occasions, as death from chloroform narcosis is held to occur frequently in those who are subjects of the lymphatic constitution. In this case the child was, except for the nævus, an apparently healthy child, well nourished, in fact a rather large child, and was four months old. Death took place quite suddenly and from no apparent cause. The *post-mortem* made by Dr. J. Alfred Scott was most exhaustive. No enlarged superficial glands were noticeable. The heart was healthy. One lung showed some congestion, and there was one slightly enlarged bronchial gland. The thyroid and larynx were normal. The thymus measured four inches in length. The mesenteric glands were greatly enlarged. Peyer's patches were more prominent than normal, and the solitary follicles of the large intestines were distinctly enlarged, but not at all to the same extent as in the previous cases. The spleen was firm and somewhat increased in size, but the Malpighian corpuscles were not peculiarly prominent. The brain seemed perfectly healthy.

Case IV.—The fourth and last case was that of a small, badly nourished child, nine months old, whom the mother said had been in his usual health until the day previous, when he seemed to have a slight cold and cough. On the day of his death he had been given his dinner of bacon and cabbage, and shortly afterwards was seized with some kind of fit, in which, according to the mother's account, his face became quite black. When brought to the hospital life was extinct. Dr. Alfred Scott also kindly performed a very thorough *post-mortem* in this case. The glands in the groin and axilla were considerably enlarged. The lungs showed a patch of congestion on each side. The bronchial glands were not enlarged. The thyroid and larynx appeared normal. The thymus measured three inches in length. The mesenteric glands were very much enlarged, but there was no evidence of any hyperlasia of the lymphoid structures in the intestine. The spleen was enlarged, and the Malpighian corpuscles were very well marked. The brain was not examined.

To recapitulate then the points of interest in these four cases:—

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1. Up to the time of death the children were, to all appearances, healthy, or only suffering from some very trifling ailment.

2. Death was sudden and quite unexpected.

3. The *post-mortems* revealed no morbid appearance to account for death, except the changes already referred to as occurring in the parts of the body where lymphoid tissue is formed—changes which are present in those who are subjects of the status lymphaticus.

Dr. Gunn very kindly made sections for me of the parts removed in Cases III. and IV., and he has handed me the following report :—

"Microscopic examination of practically all the organs prove all the organs normal, with the following exceptions :—The increased size of the solitary follicles and Peyer's patches in the intestines were due to an increase of adenoid tissue. The lymphatic glands show a simple hypertrophy, and the same condition is present in the thymus glands. The thyroid of Case III. is much infiltrated with round cells, probably inflammatory, the cells lying chiefly in the normal spaces of the gland. The spleen shows a very slight degree of increase of adenoid tissue. In Case IV. there is a marked increase of adenoid tissue in the spleen, where it has infiltrated the pulp to a large extent—no other marked change in any of the sections."

Since writing this paper another case bearing on the subject has come under my notice.

Case V.—A few days ago a boy, aged six years, was admitted to the Adelaide Hospital. He was suddenly taken ill in the morning, and his symptoms on admission—fever, headache, some irregularity of the pupils, and retraction of the head—suggested meningitis; he had also a discharge from the right ear. The possibility of pneumonia, owing to the great frequency of his respiration, was, however, also entertained. He rapidly grew

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worse, and death ensued within 24 hours of the time of the onset of the illness.

The following day I made a *post-mortem*, and found the brain perfectly healthy. On opening the thorax I was struck with the size of the thymus gland, and it occurred to me that possibly I might find further evidence of the lymphatic constitution. The lungs showed evidence of pneumonia. The lower lobe of the left lung was solid and airless, and there was a patch about the size of a walnut in the lower lobe of the right lung, also solid and airless. The heart seemed healthy. Examination of the abdomen revealed great enlargement of the mesenteric glands, the spleen did not seem affected, and the other organs, with the exception of the intestinal tract, appeared normal.

On opening the small intestine it was at once apparent that the adenoid tissue was abnormal in appearance, the solitary follicles were very much enlarged and prominent, and Peyer's patches were quite distinct and swollen. The solitary follicles of the large intestine were very distinct, but not so swollen as in the small intestine.

This case seems to me of very great interest. The cause of death was, no doubt, primarily pneumonia, but I think it is unusual for pneumonia to cause death within twenty-four hours in a young boy of six years of age, who was apparently otherwise healthy at the time. May it not be that he was the subject of lymphatism—the appearances at the *post-mortem* are very suggestive of this—and that thus his power of vital resistance being below the normal standard, he was unable to resist the sudden acute attack of pneumonia, and the slender thread of life was quickly snapt across.

In none of the English Text-books on Medicine that I am acquainted with, including Clifford Allbutt's great work, is this condition mentioned, with the solitary exception of Osler's Practice of Medicine, in the last edition of which an article is devoted to the subject. He mentions under the title Lymphatism the appearances that are usually found in such cases. The hyperplasia of the intestinal lymphatic structures, the moderate enlargement of the spleen with prominent

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Malpighian bodies, the enlarged thymus, hyperplasia of bone marrow, the yellow marrow of the long bones in young adults being often replaced by red, hypoplasia of heart and aorta, occasional enlargement of the thyroid with evidence of rickets. Of these pathological changes it would seem that the hyperplasia of the lymphatic structures is the most constant and essential characteristic. hypoplasia of the heart and aorta is frequently added, as is also the evidence of rickets and the enlargement of the thyroid.

As long ago as 1858 Friedleben denied that an enlarged thymus gland could produce fatal laryngismus either by direct pressure on the air passages or great vessels, or by reflex, cardiac, or respiratory paralysis arising from the thymus. Grawitz, Nordmann, and others maintained that such was the case, but Paltauf has clearly shown that some underlying constitutional defect must be assumed to exist in order to account for many sudden deaths usually referred to the pressure of an enlarged thymus upon the bronchi, great vessels, or pneumogastric. And further, an examination of the cases of "Thymus Tod," reported by earlier writers shows that in a majority of these cases it was noted that the tonsils, spleen, and lymphatic glands were more or less hypertrophic, though no particular significance was attached to this fact at the time.

What is the exact relation of hypoplasia of the heart and aorta to the lymphatic constitution is as yet not clearly known. Numerous writers, including Virchow, Rokitansky, Reigel, and Ortner, have published cases to show that subjects possessing this congenital defect in physical development present a diminished vital resistance, and apparently trifling causes have led to their sudden death.

As this abnormal state of the heart and aorta is certainly not present in all cases where sudden death has occurred, and where *post-mortem* evidence of hyperplasia of the lymphoid

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tissue has been found, it cannot be regarded as an essential factor in the production of the fatal termination.

The exciting causes and manner of death of the subjects of the lymphatic constitution that have been recorded include deaths under anæsthetics, after inoculation with anti-diphtheritic serum, and of persons who fell into the water accidentally or while bathing, and Escherich regards laryngismus stridulus as very probably associated with this condition.

Since it is claimed that many if not most of the deaths from chloroform anæsthesia administered by capable anæsthetists are referable to this condition, it becomes a matter of almost vital importance to be able to recognise it during life, but as yet we have no very sure data to accomplish this.

The physical signs indicative of hypoplasia of the heart and aorta are uncertain. Fraenkel mentions dilatation of the left ventricle with narrowed peripheral vessels and increased tension. Oertel has noticed an absence of aortic pulsation in the neck, which he regards as a pathognonomic sign if observed in a muscular subject, while others have laid stress on the infantile or defective development of other organs, especially the sexual organs.

Of far more importance is the discovery of a local or general hyperplasia of the lymphatic structures, enlargement of the superficial glands, hypertrophy of the tonsils with presence of post-nasal adenoids, signs of slight swelling of the thyroid, and dulness over the sternum, indicating a persistent or enlarged thymus, and in some cases the possible evidence gained by palpation of the enlarged mesenteric glands.

A careful examination of the blood in suspected cases may also be of service. Dr. Ewing mentions that he observed well-marked lymphocytosis in one of his cases, and though this condition has been frequently observed in early life, it

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has up to the present attracted little attention, nor, as far as I know, has it as yet acquired any significance.

Such is briefly our knowledge at the present time of this obscure condition.

My chief object in placing on record the cases which have come under my own notice is to stimulate others to research, and to urge the claims of the subject to more general attention.

Lymphatism may be the clue to many cases of sudden death that have occurred in the past and have seemed at the time inexplicable, and no one as yet can tell the interest and importance that may attach to it in the discussion of medico-legal questions in the future.

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NOTES ON THE YEAR'S WORK AT FARNHAM HOUSE.

By W. R. DAWSON, M.D., F.R.C.P.I.;
Medical Superintendent.

[Read in the Section of Medicine, May 17, 1901.]

LAST year, in publishing some scattered notes of the work of the previous twelve months, I ventured the opinion that an occasional selection of the small observations and experiences of practice might not be without interest and value; and I can only offer the same excuse for the following rather disjointed notes.

Heredity in the Causation of Insanity.—Although conclusions drawn from small numbers are proverbially unreliable, still, in view of the fact that an accurate history can be much more frequently elicited in the class of patients dealt with in a private institution than in that inhabiting most public asylums, it seemed worth while to ascertain to what extent a neuropathic heredity prevailed at Farnham House, taking the last 50 patients of whose family history any facts were forthcoming. In making such an inquiry it must be borne in mind that what is inherited is, not a disease, but a diathesis, which may manifest itself by the occurrence not only of insanity, but of other nervous diseases, as well as in the form of alcoholism and similar indications of lack of inhibition. Evidence of the presence of this diathesis may therefore be sought in the existence of such indications not only in parents and grandparents, but in brothers and sisters, in the collateral relations, and even in descendants, though, of course, the probability of a neuropathic taint will be the greater the nearer the relationship. On this

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principle evidence of a neuropathic heredity is to be found in no less than 39 out of the 50 patients, or 78 per cent., a proportion more than double that which Savage gives—viz., "fully one-third of all the cases."[a] Of these 39 cases, 28 had a certain family history of actual insanity, occurring in the direct line in 8 cases, amongst brothers and sisters in 14 cases, in the collateral relations in 5 cases, and in the descendants in 1; in 7 more insanity was more or less probable (in two of which number there was a neuropathic heredity of other sorts in addition); while the remaining 4 cases had a history of various other nervous affections. Of the 11 cases in which heredity was denied, some had relatives who impressed one as being decidedly neurotic; with others, however, this was not the case, so far as known. They included 2 cases of alcoholic insanity, 2 senile cases, 1 post-febrile case—all varieties not very dependent on heredity; while of the remainder 5 were cases of melancholia, the form of insanity nearest the normal.

Paranoia.—There is scarcely any form of mental disease in which neuropathic heredity plays a more important part than in paranoia or chronic delusional insanity, of which two cases were admitted during the year. This is well borne out by both cases, but especially by the second, which has run a very typical course up to the present, and will probably be a fair example of the *délire chronique* of Magnan.

Case I.—The patient, a man of thirty-two, was admitted last November. So far as known, no relative had been in an asylum, but his grandmother, father and brother were alcoholics; his mother and other members of his family, hemiplegic; and a sister extremely eccentric, if not indeed insane. He had had two bad falls on his head in early life, and one more recently. From his childhood he was eccentric, did not join in games, and tended to be solitary, morose, and self-

[a] Allbutt's "System of Medicine," Vol. VIII., p. 187.

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centred—peculiarities which grew upon him, especially for some years past, so that he appears to have had no intimate friends, and it was impossible to get to know him well. Withal he had an excellent opinion of himself (which of late has been increased by an injudicious relative with an exaggerated estimate of the antiquity and importance of his family), and he resented anything like an order or strict routine, this and other causes rendering him useless in his business, and unable to get on with his fellows. He seems to have been perfectly sober and moral. During the year before admission he developed delusions, mainly of suspicion, though with some of grandeur, thinking that he was about to receive a very high appointment, and later that he was watched by detectives, and that attempts were made to poison him. A trip to America was tried, but the only lasting result was a crop of fresh delusions (regarding Indians and the like). Finally he shut himself in his room and refused food, which was the immediate cause of his being sent from home. At Farnham House he has improved somewhat, but is morose and solitary, full of delusions of a suspicious type, and suffering at times from visual and auditory hallucinations of an unpleasant character. His chance of recovery is, of course, practically nil, and he will probably develop further delusions of grandeur, and ultimately become demented, should he live long enough.

Case II.—The other case is that of a lady, aged thirty, suffering from the less common erotic variety of paranoia, with a very elaborate and definitely fixed delusion. Her mother suffered at the menopause from delusions of the same class, so that in this instance the actual character of the disease was inherited, in a modified form, and at an earlier age, in conformity with the law of inheritance in such cases. She appears to have been an amiable, pleasant, healthy and capable, though somewhat reserved, girl, and to have taken her mother's place in the family when the latter became ill, from which, as well as from other circumstances, she was involved in much hard work and worry. A male relative whom she liked was married about a year before her admission, and from this appears to date a delusion, gradually growing in intensity, that she is herself his wife, and that his real wife is only her "proxy;" to which was afterwards added the belief that a lady friend was "proxy" for the gentleman, and she accordingly insisted on behaving to this friend in a very loverlike manner, though without

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any manifestation of the grosser forms of eroticism. Her conduct of this lady was the immediate cause of her admission in July last, and it may be said at once that the intensity of these delusions shows no sign of abating. At first she behaved well, but soon began making persistent and foolish efforts to escape, and in a few weeks became excited, violent and mischievous, wet and dirty in her habits, and sleepless at night; also refusing food, and maintaining an obstinate silence. Administration of suprarenal gland was started at the beginning of September, and on the 13th an improvement was noticeable, which continued until she showed to an ordinary observer no appearance of anything wrong mentally. (She is, and always has been, very reticent about her delusions.) It may be noted that the blood-pressure fell during the acute attack, and rose afterwards. She was allowed out on probation at Christmas, but the experiment did not succeed, and she continues much in the same state, showing a certain perverseness, restlessness, inability to control her impulses in any direction, and unreasoning likes and dislikes which she rather obtrudes; but apart from her rudeness on account of the latter she is to the casual eye ladylike and pleasant. It may be mentioned that her troublesome peculiarities tend to be aggravated at the menstrual periods, and that the menses are somewhat irregular. The prognosis here also is unfavourable.

Case III.—One of the deaths during the year was that of an old paranoiac who succumbed to sarcoma of the thigh in February. There was a bad heredity in this case also, a sister having been insane, but little is recorded about the case, which had been in the institution for the last 32 years. He was latterly a good deal demented, and it was not always easy to elicit his delusions, which, however, appeared to be of persecution, of late at all events by occult means, at the hands of mysterious individuals whom he called "Maguires."

This tendency to invent names for the mysterious authors of their discomfort is a common one in paranoia, and is present also to some degree in two other sufferers from this form of insanity who still remain.

Case IV.—The first of these is a gentleman who has been tormented for the last 52 years by agencies of whom he is very unwilling to speak, but whom he has called "itinerants" and other names, who annoy him by sending unpleasant smells through the

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floor, by causing diarrhœa, and in other ways, including a process which he calls "montriculation." This case well illustrates another point—viz., the comparatively slight tendency to general dementia in paranoiacs, the patient, even after so long a period of insanity, being well-mannered and gentlemanly, and preserving a very fair amount of intelligence.

Case V.—The last case is annoyed by electricity brought to bear upon him by "spies" and "tramps," and suffers from hallucinations of hearing in addition. He has less of the social instincts than the previous case, but also retains a good deal of intelligence, though he has suffered from his delusions for the last 33 years at least.

This last case appears to be an example of the *délire chronique* alluded to above, as the delusions of persecution have gradually during the last few years become associated with those of grandeur, the patient's imaginary position steadily increasing in importance as time goes on. From being at first merely the Duke of Wellington and a General of Division, he has grown to be a "Prince, Peer, and Field Marshal," a Grandee of Spain, the heir to the throne of England, and owner of the property in the neighbourhood of the institution. Thus two of the cases approximate to this variety, but the third and fourth prove that the succession of delusions of grandeur to those of persecution and suspicion is by no means a necessary one.

The Epochal Insanities.—Another intensely hereditary form of insanity is that occurring during *adolescence*, of which the admissions furnished one example, the form being acute mania.

Case VI.—The patient, who was twenty-five years of age, had a bad heredity, a sister having died in an asylum, while another appeared to be very neurotic. She herself was thin, pale, and looked much younger than her years. She was put on fattening diet, with cod-liver oil, and made a good recovery in about six months. The case presented few points of peculiarity, and the only one deserving of note is the excellent effect produced by the

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administration of suprarenal gland, which was given in the earlier part of the case and appeared to bring about marked improvement. It was stopped after about two months, and (seemingly as a result) progress slowed down, until the administration was recommenced about a month later, after which the rate of convalescence became much more rapid. In this connection it may be noted that the blood-pressure, which was only 100 mm. when the second administration was begun, had risen to 110 mm. at the time of discharge. She has kept exceedingly well ever since.

Two other cases admitted, although a little over the adolescent period, presented the usual hysteroidal characters of adolescent mania, and were both recurrent cases, in which the first attacks had occurred within the period. They may, therefore, perhaps be included here as, at least, akin to adolescent insanity. In neither case did suprarenal gland produce any very marked result, but it should be noted that in one the blood-pressure was high (she had albuminuria at one time). In the other, however, the pressure could not be taken owing to her restlessness.

Case VII.—Another case belonging to the group of epochal insanities which was admitted was one of *climacteric insanity* of the ordinary melancholic type, in a woman whose mother had been insane about the same period—another mode in which heredity shows itself—and whose sister was also insane. Her blood-pressure was extremely high, being no less than 180 mm. a week after admission, and small doses of erythrol tetranitrate certainly seemed to do good in the earlier and more acute period of the attack. When last taken the blood-pressure was only 125 mm., and the patient, though not well, and still showing some traces of delusion, has made much progress, though, as usual in insanity at this period, the rate is slow.

One case of pure *senile melancholia*, a gentleman aged eighty-nine, for many years an inhabitant of the institution, died last summer of nephritis following a sharp attack of influenza which he had caught while on a Christmas visit to his relations; and it may be mentioned that nephritis formed a sequel of influenza in several other

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cases who suffered in the epidemic of that disease the previous winter (that of 1899–1900).

Insanity of Toxic Origin.—The toxic origin of many forms of insanity is now-a-days so strongly insisted on, and occupies so much attention, that cases bearing on the subject acquire a special interest, and of these several have been under treatment during the year.

CASE VIII.—The first deserving mention is a *post-scarlatinal* case of which an account was given in the notes of last year,[a] but which terminated since the beginning of the year under review. The patient, a girl of twenty-three with good heredity, after an ordinary uncomplicated attack of scarlatina was seized with acute mania of a markedly hysterical character. On fattening treatment she improved rapidly and had gained two stone in weight at the end of the year. Up to that time she had shown a marked tendency to relapse at her menstrual periods, but this ceased after March, and she was finally discharged recovered about five months after admission. As pointed out in the last notes, this case illustrates Dr. Clouston's statement that no hereditary tendency is required for the development of post-febrile insanity.

CASE IX.—The relation of *gout* to mental disease is an interesting one in this connection. An acute delirium has been described, but by far the commoner form of gouty psychosis, especially in elderly persons, is melancholia, of which the admissions furnished one example. The patient, a man of seventy-two, whose sister has been insane, was admitted in April, 1900. He had been a quiet, kindly, steady-going man of business, who had borne severe pecuniary reverses at former times with philosophy, and recovered from them. It may be safely asserted that there was no unduly high living, and he is a total abstainer; but it is more than probable that sufficient exercise was not taken. For ten years he had suffered from attacks of gout occurring about once in the year and lasting for a few weeks; the disease affecting chiefly the great toe-joints, but also other joints of the feet, and the hands. A trace of albumen was found in the urine as long ago as 1895 during an attack. He has also had mitral valvular disease (stenosis) for a long time, and his digestion has latterly been poor. Since December, 1899, he had had five attacks of gout, which were in each instance

[a] Dublin Journal of Medical Science, August, 1900.

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followed by mental depression passing away on the commencement of the next attack; but the last fit of depression was peculiarly severe, and was accompanied by noise, mental confusion, restiveness, refusal of food, insomnia, vague threats of suicide, and ill-defined delusions of a depressing character. On admission he was thin, depressed and fearful, would beat his hands together occasionally and shout, and his power of attention was impaired. He complained much of thirst. The cardiac dulness extended to the left nipple line, and a loud mitral diastolic murmur was audible. There was a trace of albumen in the urine. A certain amount of flatulence was present. He was somewhat anæmic. With tonic treatment, attention to the digestive system, fresh air and moderate exercise, he improved a good deal at first and lost his delusions, but could not be got to gain in weight. Soon, however, he began to express the fear that he was going to be killed for purposes of investigation, and to refuse articles of food, on the ground that they had been drugged, and he also worried a good deal about spiritual matters. Yet his misery did not appear very acute, being of the weak senile type, which fears everything and twists things to sinister meanings. Later the delusions took the form of want of money, and also stoppage of the bowels, which latter led him to refuse food, so that he had to be tube-fed from the end of July until the middle of October, and lost weight continuously. It being thought that here, if ever, the administration of orchitic substance might be beneficial, it was begun in the middle of June and continued until October 9th, the patient receiving 15 gr. per diem in dried tabloid form up to the beginning of September, when the daily quantity was increased to 30 gr., and again on the 23rd to 60 gr. On October 13th he began to take his meals again and to improve otherwise, mentally and physically, and he seems now to have subsided into ordinary mild senile dementia with some depression, his physical health being very fair for his age, his urine free from albumen, and his digestion and sleep passable, while he has gained in weight.

It seems probable that the effect of the orchitic substance was to produce loss of weight owing to increased katabolic changes, as substances rich in nuclein are known to do, and that the marked and immediate improvement which followed its cessation was due to the reactionary stimulus to anabolism, which is also a recognised result.

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Of other toxic cases, two, more or less due to *alcoholism*, were admitted—one of mild ordinary alcoholic dementia, with the weakness of initiative common in such cases; the other marked by almost total loss of memory for recent events, though the patient, even from the beginning, could remember and tell stories. He had various delusions of orientation and otherwise, chiefly due to the want of memory, and had a weak dilated heart, enlarged liver, and albuminuria. All of these have now subsided or greatly improved. Memory, though not good, is not remarkably bad, and the patient is probably in better health, physically and mentally, than he has been for years. The case is interesting as showing the great power of recuperation possessed by alcoholic cases, even when, as in this instance, the heredity is very bad. It may be mentioned that at one time the patient suffered from attacks of distress of an anginous character, which were cut short once or twice by amyl nitrite. As the state of the heart improved under digitalis these passed off.

Two cases of mental depression associated with *glycosuria* were admitted during the year, one of which especially was of an exceedingly interesting character; but as these will be dealt with later at greater length than would be possible here, nothing further need be said at present, except that both made good and rapid recoveries;[a] the first under anti-diabetic, the second under mainly general treatment.

There can be little doubt that intoxication of some kind plays an important part in the symptoms of *cancer*, and also in those of *chronic nephritis*, though in the latter the high blood-pressure perhaps contributes. Consequently, it is no matter for surprise that a case suffering from both these ailments should develop mental abnormalities of a

[a] The latter case was discharged since March 31st.

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depressed type, though it is, perhaps, somewhat curious that this development should have been sudden.

Case X.—The immediate cause was some trifling fatigue, after which the patient, a woman of sixty-nine with some insane heredity, became suddenly depressed and suicidal, and developed delusions both of her own sinfulness and of ill intentions on the part of others towards her, with some confusion. It was only after this that she was discovered to be suffering from chronic nephritis and cancer of the stomach. Blood-pressure was extremely high, about 190 mm., but erythrol tetranitrate produced no good results, and had to be discontinued, as it caused headache. Later the blood-pressure fell a little, and she improved somewhat, but has continued up to the present very depressed, with a good deal of irritability of temper, and a certain amount of vague fearfulness, the latter being less in evidence of late. It may be noted that the mental condition improved considerably at first after she became confined to bed owing to an attack of pericarditis, and that there seemed to be a certain connection between accessions of depression and irritability and signs of increased cardiac weakness. Probably the constant gastric discomfort—there has been little actual pain—serves to keep up the irritability.

In this connection it may be noted that no fewer than 9 of the patients admitted showed *albuminuria*, though sometimes only temporarily, and it is interesting to note that of the 9, 4 were cases of melancholia, while 3 others showed a tendency to depression at times or constantly. The other two were respectively a case of acute mania, whose urine was of a febrile type, though there was no abnormal temperature, the albuminuria being transitory; and a case of hysteroidal mania, with a good deal of stupor. In both of these latter the blood-pressure was high.

The Mean Arterial Pressure in Insanity.—Allusion has been made above in several places to the state of the blood-pressure. Observations with Hill and Barnard's sphygmometer were taken in the course of the year in 10 cases—4 of melancholia, 3 of mania, 1 of paranoia, 1 of alcoholic dementia, and 1 of minor epilepsy, sane. but with

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a tendency to depression. The observations were made in the forenoon in order to avoid errors due to the diurnal variations. All the melancholic cases showed high pressure, which in all came down somewhat under treatment, and very markedly where the mental improvement was considerable—in fact, a case which has already recovered showed abnormally low pressure before discharge. The three maniacal cases were more variable, which corresponds with the observations of others. In one case the pressure was low during the attack, but rose to normal on recovery; in the second it was high all through, but rose when recovery was almost complete, probably owing to the effects of suprarenal administration, falling without bad symptoms when the drug was stopped. The third case, which has not yet recovered, showed high pressure up to the beginning of March. This case is somewhat stuporose, and also had albuminuria at one time. Of the remaining cases, blood-pressure in the paranoiac was high at first, fell during a spell of acute excitement, and rose again, but not so high, during a period of comparative mental health which followed the acute attack. The alcoholic case almost certainly suffers from chronic nephritis, and has been liable to fits of transitory depression, though cheerful in the main. His pressure was high on the only occasion on which it was taken. Only one observation was made on the sane epileptic also, whose pressure on that occasion was high. It will thus be seen that the observations, as far as they go, on the whole support the received view that states of mental depression and of stupor are associated with high arterial pressure; states of mental exaltation and of excitement, with low arterial pressure—facts which, to a certain extent, appear to afford a legitimate, though at present somewhat empirical, basis for treatment.

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Physical Health.—The general physical health was good during the year, and there was an absence of anything of the nature of an epidemic, but one or two interesting points arose which may here be briefly alluded to.

Case XI.—On October 9th last the epileptic patient above mentioned, who had been feeling somewhat weak and wanting in appetite for some days, began to pass black stools. He had several motions during the day, two very large ones at night, and one the following morning, when he felt weak and looked ill and blanched. No pain or tenderness was complained of, the abdomen was soft, the spleen not enlarged, the tongue large, moist, pale, and fairly clean, the temperature 98·8°, pulse 112. The temperature never rose above this. Opium was given, and no further large motions were passed. On the 13th it was noted that the liver was a little large, and the first heart-sound not quite clear, probably owing to the anæmia. The urine showed no abnormality. He was seen in consultation by Dr. Wallace Beatty, who found slight tenderness and a little resistance on deep pressure in the right hypochondrium, and agreed that the most probable diagnosis was duodenal ulcer, though with so few symptoms this could not be considered certain. On one occasion after this the patient vomited matter streaked with blood, but otherwise no further unfavourable symptoms arose, and he made a good recovery. Later in the autumn a very slight return of the hæmorrhage took place, but was of no moment, and the general health since has been very fair. The fits ceased for a day or two after the hæmorrhage. The patient subsequently passed through a period of pretty severe depression, probably owing to anæmia.

The only noteworthy point about a slight attack of facial erysipelas, which took place last autumn in a patient suffering from acute melancholia, was that it did not produce that improvement in the mental state which is so often seen after intercurrent febrile affections.

Case XII.—The last illness of a patient who died in January presented some points of interest. She was a strong, healthy, stout woman of about fifty-four, suffering from chronic mania, who had never had any physical ailment of importance for years except a mild attack of influenza in the previous winter. On January 1st

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last she complained of pain in the right side, and when examined was found to have a pleuritic friction-sound, and some rise of temperature, which latter subsided after four days. Some albumen was present in the urine. The rub became more distinct and widespread, and the patient was delirious and restless, though she continued to take her food well. There was little or no cough, and no evidence of implication of the lung except a few crepitating râles, which soon disappeared. On the 16th the temperature began to rise again, and remained up for the remainder of her illness, never exceeding 103°, and dropping about 2° on the average each morning. Respiration now became more rapid, there was a good deal of coughing, and the signs of effusion developed, exploration on the 23rd showing a slightly turbid fluid containing pus-cells and masses of diplococci. About this time a fœtid smell was noticed when the patient coughed, but not otherwise. On the 25th the chest was opened in the 8th right intercostal space by Mr. T. E. Gordon, who found a small quantity of very fœtid sero-purulent fluid, numerous adhesions, and a boggy mass suggesting gangrene of the lung. The wound was drained and dressed, and all went well for a time, but sleep failed, and the patient sank gradually and died on the following day. The pulse was not very rapid until the last, when the respiration also increased greatly in rate.

It seems strange that so serious a condition could have developed with such slight physical signs and so little indication of general weakness or malaise, and the cause of the gangrene is also somewhat mysterious. Probably the pleurisy was the initial lesion, the diplococci, either from their virulence or from the impaired resistance of the tissues of a chronic lunatic, setting up such severe inflammation as to lead to necrosis of the surface of the lung.

Treatment.—Many points of treatment have already been alluded to, but one or two further notes may be made on this subject here. Thyroid administration was not tried during the year, no case occurring in which it was thought to be indicated. In several cases where the blood-pressure was high erythrol tetranitrate was given, on the whole with somewhat disappointing results, though in one case

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of melancholia it certainly seemed to do good in ½ gr. doses night and morning. In most of the other cases it produced headache, and had to be stopped. One case of recent acute melancholia, in addition to being given erythrol, was kept in bed for some time, as recommended by Lewis Bruce, but the treatment produced little result in this instance. The administration of suprarenal gland, which has the opposite effect of raising the blood-pressure, while, at the same time, diminishing tissue-oxidation, was tried in seven cases, principally of mania, and the results, on the whole, are encouraging. This subject will shortly be dealt with fully elsewhere.

The comparatively new drug, bromipin, which has been much extolled by German writers, was employed with good effect in the case of minor epilepsy which has already been referred to. The patient tolerated the ordinary bromides badly, and was often reduced by them to a state of great depression. Bromipin has now been given for about ten months, with the result that he has been much happier on the whole, and has not been bromised, while the fits, though not less frequent, have been in general much shorter and less severe.

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MEDICAL EXPERIENCES IN SOUTH AFRICA.

By JAMES B. COLEMAN, M.D., F.R.C.P.I.;

Physician to the Richmond, Whitworth and Hardwicke Hospitals, and to the National Hospital for Consumption for Ireland; Late Physician to the Irish Hospital, South Africa, 1900.

[Read in the Section of Medicine, May 17, 1901.]

It is now a matter of history that when the Boer Republics declared war in October, 1899, the forces which we were able to oppose to them were utterly inadequate. The *personnel* and *materiel* of the Royal Army Medical Corps were exhausted when two army corps were provided for, and the help of civil surgeons and private hospitals had to be invoked to supply medical aid for the additional forces which were put in the field. Accordingly the Irish Hospital was equipped and sent to South Africa at the beginning of February, 1900, through the generosity and patriotism of Lord Iveagh. Its staff consisted of Sir William Thomson, Surgeon-in-Chief; Dr. George Stoker, and Dr. Alfred Friel, Surgeons; whilst I had the honour of being Physician. We had six dressers, including Dr. Counihan and Dr. Pounden, with Messrs. M'Ilwaine, Stewart, Edwards, and Thomson, and between orderlies, drivers, servants, and artificers, our company numbered about 70. When we were going to South Africa the War Office would not consent to nursing sisters accompanying us, but at a later period Lord Iveagh sent out Miss MacDonnell, Matron of the Richmond, Whitworth, and Hardwicke Hospitals; and Miss Walker, Sister in Charge of the Whitworth Hospital, and their services can only be described as invaluable.

We arrived in Capetown at the end of February, and

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were at once sent to Naauwpoort, in the extreme north of Cape Colony. Here we received orders not to set up our hospital, but to be ready to proceed to Bloemfontein when the railway line was repaired.

NO. 6 GENERAL HOSPITAL.

Whilst the Irish Hospital was delayed at Naauwpoort awaiting the opening of the line to Bloemfontein in March, I volunteered to do duty at No. 6 General Hospital, which was stationed at Naauwpoort, and was given charge of 7 marquees, containing 42 enteric cases. The hospital had about 700 beds, and I was astonished at the completeness of its equipment, situated as it was on the veldt, 500 or 600 miles from Capetown. At that time about a third of the cases in hospital were enterics. They were all lodged in marquees, there was no overcrowding, and they all had comfortable beds. There was no lack of medical comforts, but additional nurses and trained orderlies would have been desirable, especially for night duty. The medical staff of the hospital consisted of Lieut.-Col. Somerville Large and four other R.A.M.C. officers, who were occupied with the work of administration, and 16 civil surgeons, who attended to the treatment of the patients. In such a large hospital two senior medical officers would have been usefully employed as consulting physician and surgeon respectively. There were no facilities for bacteriological and pathological work, which was often necessary for accuracy of diagnosis and as a guide for treatment.

AT BLOEMFONTEIN.

The Irish Hospital opened at Bloemfontein on the 13th April, 1900, our camp being pitched on sloping ground to the north of the town, at the foot of a large flat-topped kopje. We had accommodation for 100 patients in large, square tortoise

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tents, and from the start it was practically a fever hospital. The patients were very comfortable. On admission they were washed, supplied with pyjamas or night-shirts, and put into spring beds. They had everything that was necessary, except a sufficient supply of fresh milk, and for the latter condensed milk made a fairly good substitute. At first the nursing was done by our own orderlies, who displayed great devotion in the discharge of their arduous and often unpleasant duties; but subsequently we had trained nurses, and their advent was a godsend. Our patients at Bloemfontein were under favourable conditions, and in 150 cases of enteric in our hospital there we had 19 deaths—a mortality of 12·6 per cent.

FROM BLOEMFONTEIN TO PRETORIA.

In May I accompanied the mobile section of our hospital in the march to Pretoria, Sir William Thomson being in charge. We were attached to the 11th Division, the efficient and courteous P.M.O. of which was Surgeon-Colonel Magill, of the Coldstream Guards. We had 10 ambulance waggons, and our equipment was reduced to the minimum weight. We carried tents for 50 patients, and mattresses or stretchers for the same number. It might be imagined that on the march with a large army through the enemy's country the number of wounded would predominate over the sick, but the reverse was the case. Every day on arriving in camp we took cases of enteric into hospital, and when we entered Johannesburg we had 69 patients, of whom two-thirds had enteric. Many of those cases had been carried in our ambulance waggons day after day on the march, and they suffered very great hardships, but there was no help for it, as it was impossible to leave them anywhere *en route*. Fortunately we had no death on the march, but I fear some of those patients must have died subsequently in the

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Johannesburg Hospital, where we left them, notwithstanding the good treatment they received in that excellent institution.

AT PRETORIA.

The Irish Hospital was under shell fire on June 4th outside Pretoria, and next day we entered the town. On the 10th we had 105 patients, including 60 cases of enteric. We accommodated them in marquees and square bell-tents on the veldt near the racecourse, but the patients were overcrowded, and nearly half of them were lying on the ground, whilst, to add to their discomfort, the weather was cold and wet. In fact, the state of our hospital for about ten days after entering Pretoria was very unsuitable for the treatment of grave medical cases, and it was impossible to treat the enteric patients properly. But this state of things did not continue, for Sir William Thomson applied to the military authorities for the Palace of Justice for use as a hospital, and they not only consented, but allowed the building to be fitted up and furnished luxuriously for the reception of 500 patients. In this onerous undertaking invaluable assistance was given by the Hon. Rupert Guinness, Mr. Murray Guthrie, M.P., and Mr. Leigh Wood. On June 19th we transferred our patients to this building, equipped as it now was with electric light, hot and cold baths, and good beds. The rest of our staff arrived from Bloemfontein at the beginning of July, and the P.M.O. supplied additional nursing sisters and orderlies. A high standard of excellence was attained in the management of the Irish Hospital in the Palace of Justice, and it is no exaggeration to say that the patients were as well off as they would be in many a first-class civil hospital at home. We remained in the Palace of Justice in Pretoria until we left for home last October.

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ENTERIC FEVER.

Of the medical cases treated in the Irish Hospital, first in importance comes enteric fever, which constituted a terrible plague during the campaign. At the end of June, 1900, Lord Roberts informed me that there had been 6,500 cases of the disease at Bloemfontein alone, with 1,300 deaths. At the same place two general hospitals had nearly 3,000 cases at one time, and everywhere at the seat of war the same scourge afflicted our troops.

In our hospital register there are entered 672 cases of enteric, but I think the number treated was considerably in excess of that figure, for in many instances the diagnosis in our register was taken from the admission forms, and was not afterwards corrected. For instance, many cases were sent in as "simple continued fever" which were really enteric, but the former diagnosis appears in our returns.

I had 260 cases of enteric under my care, and through the courtesy of my colleagues I saw many of their cases. In general, the type of the disease did not differ from what we see at home. The diagnosis in doubtful cases was confirmed by a positive Widal reaction. In Bloemfontein I used the dead typhoid bacilli for the serum diagnosis, and I found they "clumped" satisfactorily with enteric serum. In Pretoria I had the use of the Staats Laboratorium, which was carried on under the able direction of Dr. Schmitz Dumont. Here I started fresh broth-cultures of typhoid bacilli, which I renewed from time to time, and I classed no doubtful cases as enteric in the absence of a positive serum reaction.

The temperature in our enteric cases calls for a few remarks. It was very high and very irregular. Twenty per cent. of my cases had a temperature over 105° F., and two cases over 106·5°. Late in the disease there was extreme intermittence, so that malaria had been wrongly diagnosticated.

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Enteric spots were present in 85 per cent. of the cases, and a transient erythematous rash in 10 per cent. Diarrhœa, on the other hand, was not troublesome in more than 20 per cent. of the cases.

Intestinal hæmorrhage occurred in 9 per cent. of the patients. The spleen was enlarged and the abdomen distended in nearly every case. Delirium was frequent.

Lung complications were common, particularly bronchitis (18 per cent.), pleurisy (3 per cent.), pneumonia (2 per cent.), and œdema of the lungs. In two cases I saw Cheyne-Stokes' respiration.

Peritonitis and perforation occurred in less than one per cent. of the cases, and thrombosis in 6 per cent.

The less frequent complications included epistaxis, meteorism, otorrhœa, neuritis, laryngitis, tonsillitis, parotitis, orchitis, retention or incontinence of urine, albuminuria, hæmoglobinuria, cystitis, urticaria, boils, mania, syncope, and hyperpyrexia.

Relapse or recrudescence was noted in about every fifth case.

As to the mortality in enteric, we had 79 deaths in 672 cases, being a death-rate of 11·7 per cent. This was much lower than the general enteric mortality, but I make no invidious comparisons, as the conditions under which cases were treated were never alike. Eight of our cases died within 48 hours of admission to hospital, and four more within 72 hours. For a month after the occupation of Pretoria the condition of the Irish Hospital as regards equipment, &c., was superior to other hospitals near the capital of the Transvaal, and for this reason we were sent an undue proportion of very severe cases. For instance, on 20th June we received a sick convoy of 30 cases of enteric, which were sent from a field hospital about 12 miles east of Pretoria. Those cases were selected as the most severe of

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120 cases in the field hospital, and they were sent to us as we had greater facilities for treating them. I regret to say that 9 of these patients died, some of them being moribund on admission.

The most frequent cause of death was heart failure, and this occurred both early and late in the disease. Many of the fatal cases presented the picture of a severe toxæmia, and in such cases a pulse rate over 120 was always an ill omen. Among the fatal cases bronchitis and œdema of the lungs were very common, pneumonia was present in about 4 per cent., and perforation in 6 per cent. In one case cardiac syncope occurred in convalescence.

Post-mortem examinations were made in most of the fatal cases, and the usual enteric lesions were found.

The treatment adopted was expectant. For heart failure, stimulants and strychnin; for diarrhœa, restriction of the quantity of milk was usually all that was called for; for hæmorrhage, opium and turpentine mixture; for pyrexia, sponging or cold compresses, and occasionally cold baths. Wherever possible the use of the bed-pan was insisted on, and patients were not allowed to leave their beds for any purpose. During convalescence I endeavoured to increase the amount of the patients' diet as rapidly as possible, each case being treated on its merits, and the general condition of the patient being considered in addition to the one symptom of temperature.

Many of the troops were subjected to anti-enteric inoculation, and the value of the process has been much discussed. Whilst it cannot be described as an unqualified success, I believe it has been of use both as a preventive and in modifying the attacks of the disease.

Out of some sixty men of the staff of the Irish Hospital who had been inoculated six contracted enteric and one died. About 12 per cent. of all our enteric patients had been

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inoculated, and in the majority of these cases the attacks were mild and of short duration. Among the inoculated cases the death-rate was 6·2 per cent., as contrasted with 12·5 per cent. in the uninoculated.

—	Cases	Deaths	Mortality per cent.
Inoculated - -	80	5	6·2
Uninoculated - -	592	74	12·5
Total - -	672	79	11·7

Too much should not be expected from inoculation when we consider that enteric may occur more than once in the same individual, and we cannot expect inoculation to produce stronger immunity than an attack of the disease confers. We had several patients who had enteric before, in India or elsewhere.

I have already remarked that many cases of enteric were sent to our hospital with the diagnosis of "S. C. F." (simple continued fever). I quite satisfied myself that those cases were enteric. In many instances they presented the clinical symptoms of enteric, and autopsies were performed on fatal cases, which showed typical enteric lesions in the intestines. Other cases, though very mild on admission, had undoubted enteric relapses; whilst in others the history was characteristic. Finally, numerous cases which I examined gave a positive Widal reaction.

I believe that ambulatory enteric was common, but I do not contend that every patient with ill-defined febrile symptoms had enteric. I allowed the diagnosis of simple continued fever to stand in some cases, and influenza or febricula accounted for others.

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The exaggerated intermittent temperature which was present towards the termination of an attack of enteric occasionally led to the mistaken diagnosis of malaria or "typho-malaria." The effect of large doses of quinine in reducing such temperatures was adduced in favour of their being of malarial origin, but the temperature fell also in the absence of quinine. Further, I examined the blood of such cases for the plasmodium malariæ always with a negative result, whilst the same blood gave a positive Widal reaction.

OTHER MEDICAL CASES.

Medical cases other than enteric do not call for much comment. Dysentery was common, but the disease assumed a mild type, and the mortality was less than 1 per cent. I failed to find the amœba coli in the stools, and in no case did I see an abscess in the liver. The catarrhal form of the disease prevailed. For treatment, rest, milk diet, and sulphate of magnesia were efficacious, whilst the administration of ipecacuanha was disappointing. The worst cases of dysentery which I saw, including two fatal cases, were chronic cases of the disease which had been originally contracted in India.

Diarrhœa was very prevalent. Few men escaped a severe attack within a short time after landing in South Africa, and a certain amount of immunity resulted. The complaint was commonly known as "modders," from its supposed origin in drinking the Modder* river water. In some cases symptoms of severe enteritis or of gastro-enteritis were present.

A number of patients suffering from catarrhal jaundice were admitted to hospital about the time of the occupation of Pretoria.

Comparatively few patients were admitted to the Irish

* Muddy.

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Hospital with malaria. Basing the diagnosis on the presence of the plasmodium in the blood, I came across no case in which malaria had been contracted in the Orange River Colony or in the Transvaal south of, or in, Pretoria. Most of the patients admitted for malaria had the disease previously in India or in Egypt, or in Rhodesia, but in some instances it had been acquired in the northern or eastern districts of the Transvaal. Simple tertian ague was invariably the form of the disease in the patients examined by me.

Rheumatic fever was of frequent occurrence, complications being few. Some cases were much prolonged.

Of pulmonary complaints the most serious was acute croupous pneumonia, whilst bronchitis and pleurisy were also prevalent.

Acute or subacute Bright's disease was not of uncommon occurrence, and a few patients were admitted with Bilharzia disease (endemic hæmaturia).

I saw many cases of "irritable heart" and tachycardia, and of the rarer diseases I may mention Addison's disease and alopecia universalis. One case of diphtheria occurred in our wards at Pretoria.

Before concluding I would wish to emphasise the fact that the number of medical cases in the hospitals in South Africa was vastly in excess of the surgical cases, and the corollary is that physicians were more needed than surgeons. In the Irish Hospital we treated 2,748 patients, of whom more than five-sixths were medical. Contrast our 672 cases of enteric with 114 cases of bullet-wounds. In Bloemfontein in the large general hospitals the enteric patients outnumbered the wounded in the proportion of 20 to 1. Looking at the official lists of casualties, how often do we not see the statement at the top of a long list of deaths, "Died of enteric unless otherwise stated?"

Consulting physicians would have been of incalculable

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service in all the large hospital centres at the seat of war, and it is to be hoped that if, unhappily, the occasion arises again the sick will have the benefit of the services of a sufficient number of such physicians.

I have to express my thanks to my most efficient clinical clerks, Messrs. Percy Stewart and John M'Ilwaine, to whom I am indebted for notes of my cases.

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SECTION OF SURGERY.

THE SURGICAL TREATMENT OF NON-MALIGNANT STRICTURE OF THE PYLORUS.

By T. MYLES, P.R.C.S.

[Address at Opening Meeting of the Surgical Section, November 9, 1900].

At this, the first meeting of the Session, one naturally looks around to see who are present and who are absent, and such a survey to-night shows us that two well-known figures are no longer amongst us.

Since this time last year this Section has lost two of its most active and distinguished members—the late Mr. W. I. de Courcey Wheeler and Sir William Stokes. Both were regular attendants at our meetings, and contributed largely by their writings and criticisms to make the Section popular and instructive. Of Mr. Wheeler we may justly claim that he was the pioneer in the surgical treatment of suppurative diseases of the middle ear and its many complications. His original paper on the subject read before this Section, illustrated as it was by numerous dissections and notes of cases, gave evidence of most laborious research and originality of thought. It excited, as all departures from the beaten track must do, a storm of comment and criticism; but yet Mr. Wheeler, at least, had shown us the road, which has since been more accurately defined by the anatomical researches of Professor Birmingham, and illuminated by the brilliant operations of Professor Macewen in Glasgow, and my colleague, Mr. Woods, in the Richmond Hospital.

Of Sir William Stokes it is hardly necessary for me to

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speak. His tragic death in South Africa, just as he was preparing to come home, caused a widespread feeling of sorrow and sadness through the land. To us, the members of this Section, his loss is very real.

Many of us lose an old and valued friend, all alike lose the keen intelligence, professional enthusiasm and wide surgical experience which gave his contributions to our meetings such a high educational value.

I could say much more to you concerning our two friends, but it is not necessary, as each one of you is fully aware of how much this Section has lost by the premature death of two such distinguished Irish surgeons.

Having paid this very brief and insufficient tribute to the memory of the departed, I now heartily welcome you to this the opening meeting of the Surgical Section of the Academy, and hope that the Session now commencing may prove as useful and instructive to us all as the many others that have preceded it.

The subject I have chosen for my Address to-night is "The Surgical Treatment of Non-malignant Stricture of the Pylorus."

Some fifteen years ago the medical and surgical world was astounded by the daring proposal of Loretta, of Bologna, to treat stricture of the pylorus by simple dilatation with the finger following a gastrotomy. The older men looked upon the suggestion with horror, the younger were fascinated by the daring and simplicity of the proposal. Promptly every energetic operator began to look around for appropriate cases, and at first a perfect avalanche of successful operations were recorded in the journals. It is a strange fact that in a profession such as ours—where one would least expect to see it—the extraordinary loss of individuality usually observed only in large masses of people collected together, should be so

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strikingly apparent. This peculiar mental phenomenon, discussed recently at some length by an Italian philosopher under the title of "The Psychology of Mobs," and due apparently to some subtle influence transmitted from one individual in a crowd to another by direct contact, seems to have its counterpart amongst ourselves. Some man of original thought propounds an idea or a theory; straightway, apparently without the smallest reflection, it is eagerly seized upon by the admiring multitude, put into execution, and its results triumphantly blazoned forth as most brilliant successes. One of the most striking exhibitions of this mental phenomenon occurred during what I may call the "Tuberculin Mania." Even the youngest of us can remember the crowds of cases of tubercular ailments alleged to be cured by the Koch treatment. The journal of the Royal Academy of Medicine bears eloquent testimony to the truth of my assertion. Yet, alas! tubercular disease is still with us, and to Koch's remedy itself one might well apply the sad comment of Marc Antony:—

"But yesterday and Cæsar's word might stand against the world;
Now none so poor as dare to do him reverence."

As with Koch's tuberculin, so with the daring proposal of Loretta during the first stage of enthusiasm. Every case was a success; the danger was nil, therefore open every stomach, stretch every shrunken pylorus, and, above all, publish your cases before they disappear into their last resting-places.

But this wave of enthusiasm passed away; the elder, and probably, therefore, less emotional, began to think, and very soon a reaction set in. Reports of fatalities were heard from time to time, recurrence of symptoms were noticed, cases supposed to be non-malignant proved to be malignant, and gradually the operation fell into disfavour.

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Those who were formerly the loudest in their expression of admiration now sought for something else to shout about. Soon after Loretta's operation had reached the stage of hostile criticism the idea of short circuiting the gut, by lateral anastomosis between the stomach and small intestine, was brought forward—first, I think, by Mr. Senn, and later, modified in technique, by the equally brilliant Professor Murphy, of Chicago. With the details of these operations you are all familiar by this time.

The method suggested has many advantages, and is undoubtedly an improvement on the idea of Loretta, but it has the disadvantage of appearing rather to dodge the difficulty than to remove it. To practical men this is not of much importance, but it undoubtedly leaves the sensation in the mind of the operator of being merely a substitution of a lesser for a greater evil.

To meet the objections urged against the short circuit method, Professor Mickuliz proposed and put into execution his now well-known operation.

Successful isolated cases illustrative of the method have been laid before this Section before now, so that I cannot claim any priority for my record, but the fact that I have performed the operation now some seven times with one death may render my experience of some practical interest.

I do not intend to trouble you with any superfluous details as to diagnosis or technique of the operation itself in the remarks that are to follow.

In all my cases, the diagnosis was either already made by the physician in charge, or I was assisted by the great skill and experience of my medical colleagues, Drs. O'Carroll, Coleman, and Travers Smith.

Case I.—A young man, sent me by my colleague, Dr. Coleman, whom we hope soon to welcome home from South Africa. This

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was the only case I lost in the series, and his death was, I frankly confess, due to the method adopted. Needless to say he was extremely emaciated, and not in a condition to stand a prolonged operation.

On opening the abdomen, the pylorus was found fixed rigidly by adhesions to the liver above and intestine below. Exposure of it was therefore difficult and tedious, and the operation lasted a much longer time than I could have wished. He sank rapidly after it, and died some eighteen hours later. With my present experience I would never dream now in such a case of continuing the operation, but would at once short circuit the bowel by means of a Murphy's button.

Case II.—This case was a man aged forty-two, of rather intemperate habits, but of a placid disposition, who was sent me by my friend, Dr. F. Sullivan of Navan, to whom all the credit of the very accurate diagnosis is due. I operated on him in the Richmond Hospital, assisted by my friend, Mr. Harvey, our Assistant Surgeon. The operation proved very easy, and was absolutely successful.

Last Session, at I think the very last meeting, I showed him and three other similar cases, operated on about the same time. He appeared dressed in khaki, having joined the Dublin Company of the Imperial Yeomanry, and since then he took part in the four days' desperate fighting at Lindley, which preceded the surrender to overwhelming numbers of our local corps of Volunteers.

Case III. was a woman aged thirty-seven years, a domestic servant in Rathmines. The tentative diagnosis I made was confirmed by the skill and knowledge of my friends, Drs. O'Carroll and Travers Smith. The operation was absolutely simple, the result a success, and the woman is now back at her work.

Cases IV. and V. were identical almost with this, and call for no comment.

Case VI., however, was very different, indeed, one might say dramatic, in character. This was a gentleman aged sixty-two, who for nine months had nothing but small quantities of liquid food, and who undoubtedly owed his life to the skill and care bestowed upon him by his medical attendant, Dr. T. W. Rice of Portarlington. When the operation was contemplated even the most cursory examination showed that the mere railway journey alone

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would probably be fatal. He was a perfect skeleton, reminding one rather of the dreadful figures depicted in the illustrated papers of the famine-stricken natives of India than of a well-to-do gentleman in an Irish country town. I resolved, therefore, to operate on him in his home in the country rather than risk the journey to Dublin.

In the operation I was assisted by Dr. Rice, the anæsthetic being administered by my friend Dr. R. Lane Joynt, to whose wise forethought the patient at a critical moment owed his life.

A few moments after the ether administration began, the patient suddenly collapsed and became apparently moribund. Fortunately Dr. Joynt had ready a hypodermic needle, charged with strychnine, a large dose of which he instantly injected. Artificial respiration was at once begun, heat applied to epigastrium, and the patient held up literally by the heels by Dr. Rice. The moment he began to show signs of returning animation I opened the abdomen, and fortunately, without any trouble whatever, got the pylorus into view.

The rest of the operation was performed with every ounce of energy I had in my body, and was completed, imperfectly no doubt, in a few minutes. I made no attempt to accurately close the wound on the pylorus with a double row of sutures; a single continuous suture through peritoneum and subperitoneal tissue had to suffice. I relied on a gauze drain of goodly size to ward off danger. A couple of sutures through wound in parietes were rapidly passed with a Reverdin's needle, a dressing applied, and the patient put to bed. The usual vigorous measures were adopted to counteract the shock, and were quite successful.

For a few days of course we had a terribly anxious time, but the fact that, through Dr. Rice's training in the previous nine months, he had grown accustomed to rectal alimentation proved of immense benefit to him. To-day he is back again at his business, and some of you may remember seeing a well-dressed gentleman sitting at a meeting of last session alongside my friend in khaki, in the Library of the College.

Case VII.—The last of my cases was also of sufficient interest to justify a few brief details.

This was a woman, wife of a farmer in Co. Wicklow. The history of the case pointed clearly to pyloric stricture, but examination and palpation revealed the fact that she had a floating

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kidney on the right side, and the question at once arose, Were all her symptoms due to the floating kidney alone? The exhaustive paper on this subject from the pen of our gifted countryman, Mr. Kendal Franks, now in South Africa, contained the record of a large number of cases in which all the symptoms of pyloric obstruction were associated with floating kidney, and were relieved by treatment of the last-named condition. After considerable reflection I determined to expose the kidney by an incision through the right semilunar line, and, having fixed it, proceed to examine the pylorus by palpation through the same wound. This I did. The kidney was exposed, stripped of its capsule, replaced and held in position by a suture of formalin catgut, through a small portion of the lower end of the capsule, left attached for the purpose. The other end of the suture was passed through the quadratus lumborum muscle and the fascia over it. The peritoneum was now opened at the inner side of the wound, and the stomach carefully examined. As the pylorus felt thick and puckered, I decided to expose it. This I did by thrusting my left hand into the wound and across to the left side and cutting on it. This enabled me to work rapidly. The pylorus was now brought out through the second wound, and held by Dr. Harvey, while I rapidly closed the first wound in the right semilunar line. I now opened the stomach in the usual way, divided the pyloric stricture, and completed the operation. The double simultaneous operation on the kidney and stomach is, I think, somewhat unusual. The patient made an uneventful recovery.

This group of cases, I think, will help to show that the operation of pyloroplasty in suitable cases is both safe and easy of accomplishment. The danger lies, first, in the fact that all such patients are necessarily extremely debilitated, on whom any operation is hazardous, and secondly, in the possibility that it may be attempted, as in my first case, under circumstances in which it is not the appropriate procedure.

When there are no adhesions, and the pylorus can be easily exposed, it is the operation *par excellence;* but when adhesions exist it is unjustifiable. In the latter

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cases lateral anastomosis by the readiest method should be established.

The modifications of the original operation lately suggested by French surgeons, by which the mucous membrane remains undivided, are hardly worth serious criticism.

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ON THE REMOVAL OF GREAT LENGTHS OF INTESTINE.

By ALEXANDER BLAYNEY, M.A., M.B., F.R.C.S.I.

[Read in the Section of Surgery, December 8, 1900.]

THE preparation of this paper has arisen out of my having been very kindly entrusted by Mr. Hayes with the publication of a case in which he performed, with perfect success, a very extensive resection of the small intestine in a boy aged ten. The operation was done, as I shall immediately detail, for a crush of the intestine with extensive laceration of the mesentery. The notes of the case are briefly as follow:—

CASE.—A boy, P. B., aged ten, was admitted to the Mater Misericordiæ Hospital on Friday, August 3rd, about five o'clock, with the history that he had been run over by a heavy waggon. When crossing the street he was struck by a horse and thrown on the ground in the prone position. While in that position the wheel of a heavy waggon, weighted with a ton and a half of grain, passed across his lumbar region. He was taken up and immediately removed to hospital. On his arrival there he was found to be suffering slightly from shock, his face was pale, pulse about 90, temperature slightly subnormal. Examination of his abdomen and back showed considerable bruising in the lumbar region and on the front of left thigh; a small hæmatoma was present on the front of the abdomen, about midway between the umbilicus and pubis. Over the right Poupart's ligament was an elongated irregular wound about five inches long. The abdomen was slightly rigid and tender to the touch. He did not make much complaint of pain. There had been no vomiting. On passing a catheter, about three or four ounces of perfectly clear urine came away. There was thus no very clear indication for surgical interference beyond dealing with the wound on his right side, and combating the shock which was present. The skin around the wound was

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cleansed, and the edges brought together over a length of gauze. For the shock he got a hypodermic injection of four min. of liq. strych., and external heat was applied in the form of hot jars. No food was given by the mouth. A careful watch was kept for the further development of symptoms. Strange to say, in view of the grave lesions subsequently found to be present, he passed a fairly good night, sleeping well, with some intervals of wakefulness and slight restlessness. In the morning, however, he began to vomit, and the vomiting was repeated two or three times—greenish bile being brought up each time. His condition now had much altered for the worse—he became very restless, and complained of much pain and great thirst. His pulse was found to be very rapid—93 to the half-minute. His abdomen was swollen, tense, and tender, especially over the epigastric region, tympanitic to percussion, but without loss of hepatic dulness. Temperature was 101·5°. It was evident that a grave abdominal lesion had occurred, and laparatomy was at once proceeded with—the provisional diagnosis of ruptured intestine having been made. After the preliminary cleansing of the skin, the patient being under the influence of ether, a median opening was made in the usual situation, between umbilicus and pubis. On reaching the abdominal cavity, some liquid blood mixed with clots came forth, and swollen intestine tended to protrude. The distended coil was drawn forth, and there followed it more blood, which was dried up with sponges. On examining, now, a long, transverse rent was discovered in the mesentery—about three inches from the intestine—cutting off the blood supply of a huge coil of the intestine, while above this again was another portion of intestine, which was so crushed that its vitality was evidently gone. At this place the intestine was somewhat twisted on itself, so that its lumen was interrupted; above this was healthy, but distended intestine. No perforation was present in any part of the intestine. It was at once determined to remove the whole damaged segment, which was done after tying off and dividing the mesentery which intervened between the rent and that connected with healthy intestine. The upper margin of the rent in the mesentery was not ligatured—hæmorrhage from the vessels having already ceased. A long pressure forceps was then placed on the intestine, at the upper and lower limits of the portion to be removed, the latter being about five inches from the ileo-cæcal valve. Above and below the lumen was blocked by lightly tying a piece of rubber tubing passed through a hole in the

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mesentery (made with a blunt instrument), about three inches away from each clamping forceps. The gut was now cut through close to each forceps, and the segment thus freed removed. The ends were then brought together by a Murphy button, and over the line of union a few Lembert sutures were inserted. No attempt was made to suture the gap in the mesentery, as the patient's condition did not admit of delay. The wound was now closed, the usual antiseptic dressing applied, and the patient sent back to bed. He had borne the operation fairly well, considering its extensive character; but, for two or three days, his condition was such as to rouse the gravest anxiety. His pulse rate continued for some time to fluctuate between 140 and 160, and his face presented an extremely anxious and haggard appearance. His temperature, which on the night of the operation was 100° F., rose to 102° the next morning. The evening after the operation it had fallen to 98°; next morning it was 98·8°, rising to 99·6° on the second evening; since which time it has remained normal, or within a few points above it. The treatment during the earlier days was as follows:—Strychnine (m4 of liquor) was given hypodermically every sixth hour. On the night of the operation he got a zyminised suppository, and this was repeated every fourth hour. In addition, nutritive enemata, containing a beaten-up egg with some brandy and milk, was given every night and morning. Nothing was given by the mouth for the first three days but sips of hot water and a teaspoonful of brandy every hour. On the third day, milk, diluted with equal quantities of hot water and panopeptone, was given to him, a teaspoonful every second hour. This treatment with the rectal feeding was continued for three days, when gradually the diet was increased by the addition of arrowroot, bread and milk, and, finally, a little beef, the enemata being now stopped. His bowels moved spontaneously on the third night after the operation; on the fourth day there was again a motion, followed by two during the night; after this they moved regularly once a day till the twelfth day, when an attack of diarrhœa set in, the patient having six motions in the twenty-four hours. Subsequently, there was a great tendency to looseness of the bowels—a condition which lasted for more than seven weeks. This tendency, however, gradually disappeared, so that his bowels acted fairly regularly once a day, occasionally twice. To all appearance the fæces passed were normal.

His appetite was, however, abnormally great for one of his

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years, notwithstanding which his weight when leaving hospital was only 3 st. 9 lbs.

A later examination made yesterday shows that this fairly satisfactory condition has not been maintained. His appetite still continues to be abnormally great, and since leaving hospital he has had attacks of vomiting. This occurs every day for some time, then disappears for a few days, again to return. He suffers, too, occasionally from abdominal pains. The tendency to looseness of the bowels has re-appeared—his bowels moving sometimes three or four times in the twenty-four hours; as a rule, they move twice. The fæces passed are solid, and look pretty normal, but I regret to say that I have not found time to make a chemical analysis. I hope to be able to remedy this, and gain more accurate knowledge as to the amount of undigested fats, proteids, and carbohydrates passed. At present, too, the boy is suffering from chorea—a condition which was not present when leaving hospital about five weeks ago. He has also distinctly lost in weight, and might be described as markedly emaciated.

These changes, with the exception of the chorea, are probably to be attributed to the alteration from the hospital to home diet.

The operation wound had healed by the first intention, so that the stitches were removed by the twelfth day; but the wound he had received when run over suppurated, and healed tediously by granulation. A word is necessary with regard to the Murphy's button. The date of its being passed cannot be fixed, as, unfortunately, it was thrown away by the wardmaid without having been noticed by her. That it was passed, however, is quite certain, as two or three skiagraphs have been taken, revealing all the details of the pelvis and spine, but having no shadow corresponding to the button.

The intestine, which, inasmuch as its limit extended to within about five inches from the ileo-cæcal valve, consists entirely of ileum, when measured after removal, was found to be 8ft. 4½in. in length (255 cm.), and, even now, when somewhat shrunken in formalin, measures 8ft. 2in.

When, after the first few days succeeding the operation, it was seen that the boy was likely to survive the immediate effects of the resection, the question arose as to what would be his state thus deprived of such a large amount

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of actively absorbing surface—a question interesting to the surgeon, and even more so to the physiologist.

In the elucidation of this problem two methods are open to us—the clinical—*i.e.*, the study of recorded cases in which considerable lengths of intestine have been removed; and the experimental—animals being submitted to operation in which they are deprived of large portions of their gut. This latter method has been pursued by Senn, Trzebicky, and Bonari. Senn, who was the first to undertake the work, used as his material cats and dogs, on which animals he performed extensive resections of the small intestine in seven cases; of these, however, only two were available subsequently for the purposes of the experiment. In both of these an intense long-continued and eventually fatal marasmus, with diarrhœa and increased appetite, was the sequel of the resection. As a result of these experiments, Senn came to the conclusion that the excision of more than one-third of the whole length of the small intestine was an operation dangerous to life, productive of marasmus, and, in this way, fatal sooner or later. He directed attention to a compensatory hypertrophy of the intestinal wall, which he found to be present in these cases which had survived for a considerable time. The conclusions of Trzebicky, as a result of 28 extensive resections of the small intestine, performed on animals, are as follow:—

Resections of half the small intestine were tolerated quite well; and resections of two-thirds and upwards of the jejunum and ileum made such an inroad on the chemical and mechanical processes of digestion that the prolongation of life became impossible. There was incessant diarrhœa, followed at a later stage by vomiting, food was voided for the most part undigested, and, in spite of a craving appetite, the animals perished with symptoms of

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complete inanition. Trzebicky also observed that the effects of the resection of the beginning of the jejunum were more serious than those of resection nearer the ileo-cæcal valve—a result to be expected, considering the wider, thicker, and more vascular condition of the jejunum. Transferring his results to the human subject, and taking 560 cm. (18 ft. 5 in.) as the minimum length of the small intestine, he declared that resection of one-half of it—*i.e.*, 280 cm. (9 ft. 2½ in.)—was quite permissible, provided no further complication were present. Bonari goes even a step further. He believes to have proved by his experiments on dogs that seven-eighths of the intestine can be removed without the production of important interference with metabolism. He asserted that at least one-half of the small intestine may be removed in men without the person's metabolism being very much influenced for the worse. Like Senn, he found hypertrophy and hyperplasia of the gastro-intestinal tract in the dogs which had been operated upon, and where the operation was well borne the mucous membrane was thicker and more richly covered with villi. In those dogs which had died he found that the intestine left behind had become atrophic, the atrophy showing itself in wasting of the villi and desquamation of epithelium. We thus see that these observers are not agreed among themselves as to how much intestine may be safely removed from dogs, while in their inferences in applying the results of their experiments to man, two agree that removal of one-half is feasible without producing any grave disturbance in assimilation, while Senn would assign one-third as the extreme maximum limit.

I need hardly say, in conclusion of this part of my subject, that extreme caution is always to be observed in applying the results of experiments on animals to man.

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Coming now to the second method of investigation—the clinical—one or two considerations arise which call for some comment before giving the results which may be arrived at by the study of recorded cases. In the first instance the results obtained cannot be compared merely on the ground of the actual lengths of intestine removed. The excision of a large portion of the jejunum will have much more serious consequences than that of an equal length of ileum; while, in a similar manner, the loss of ileum will be more felt than that of large intestine—the difference in physiological importance between these being even greater than between jejunum and ileum. Again, as Dreesman has pointed out, the amount of intestine removed is not of so much importance with regard to the ultimate result of the operation as the amount of intestine which remains behind; and with regard to this latter point, in a successful case we must always remain more or less in the dark. No doubt we may subtract the amount removed from the average length of intestine, which Treves, as a result of the examination of 100 bodies, places at 22 ft. 5 in. for the small intestine. But the variability of the actual lengths is very great. Thus, in Treves' cases there was a difference of more than 16 feet between the extreme cases, which measured 31 ft. 10 in. and 15 ft. 6 in. respectively. Other observers have found equally great variability. The difficulty in making the calculation in Mr. Hayes' case is still further increased by the fact that his patient was a child aged ten. In trying to elucidate the question of the relative length of the intestine in the child and the adult I have been assisted by Professor Birmingham, who kindly lent me some books by the authorities on the subject; but the conclusions I arrived at are not very illuminating. Briefly, there is no proportion between growth

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in length of the intestine and the age of the patient, growth being in some very rapid in childhood, in others comparatively slow. The intestine, however, does, as a rule, keep on growing till adult life is reached, so that in Mr. Hayes' case 20 ft. for the small intestine is probably a high estimate. Thus, in his case, very considerably more than one-third of the small intestine has been removed. Dreesman, in 1899, was able to collect 26 cases (including one of his own), in which more than one metre had been removed. To these I am able to add 7 more, including Mr. Hayes' case, thus bringing the number up to 33.

Placing them in the order of the length of the intestine removed, they are as follow:—

1. Hahn.—80 cm. (32 in.) ileum, 20 cm. (8 in.) colon, male, thirty-eight years. recovery without disturbance of nutrition.

2. Canthorn (*New York Medical Journal*, 1895) resected 43 inches (109 cm.) of small intestine from a man aged forty-nine for sarcoma of mesentery; ends united by Murphy's button. Patient recovered from operation, but died four months later from obstruction brought about by Murphy's button.

3. R. Budberg-Boeninghausen and W. Koch.—Male, sixty-eight years, very robust; 110 cm. flexure (43½ in.); death on third day from peritonitis, which existed at time of operation.

4. Do.—Male, thirty-three years, 110 cm. (43½ in.); ileum, for gangrene after incarceration; femoral hernia; recovery.

5. Trombetta, in 1884, resected 110 cm. (43½ in.) of small intestine in a woman aged forty; recovery (quoted by Luggi).

6. Budberg-Boeninghausen and Koch.—Male, forty-

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two years, 112 cm. (44 in.); flexure; gangrene after twisting; recovery.

7. Maston resected 112 cm. (44 in.) for sarcoma of mesentery; death five months afterwards from perforation due to Murphy's button.

8. Billroth.—Female, fifty-two years, 113 cm. (45 in.), small intestine on account of fixation by the extirpation of a fibroma size of child's head; death from collapse.

9. Troje.—115 cm. (46 in.); female, twenty-five years; for four ring-like tubercular strictures; result fistula.

10. Elliott (*Annals of Surgery*, January, 1895) resected 124 cm. (4 ft. ¾ in.) small intestine in a man aged twenty-five, for infarction due to thrombosis of the superior mesenteric veins. Patient was in good health two years after.

11. Roux (*Sem. Med.*, 1893) resected 124 cm. (4 ft. 1 in.) of intestine for a lipoma; recovery.

12. Budberg-Boeninghausen and Koch.—125 cm. (4 ft. 1 in.) flexure; death from already existing peritonitis on the same day.

13. Budberg-Boeninghausen and Koch.—125 cm. (4 ft. 1 in.) ileum; death on day of operation from already existing peritonitis.

14. Obalinski.—126 cm. (4 ft. 2 in.) ileum for gangrene; death in 24 hours.

15. Studsgard.—128 cm. (4 ft. 3 in.) jejunum for invagination; death five days after from peritonitis.

16. Schlange.—135 cm. (4 ft. 6 in.) ileum; gangrene; recovery without disturbance.

17. Braun.—137 cm. (4 ft. 7 in.) small intestine on account of circumscribed peritonitis. The woman recovered in the beginning, but soon the appetite began to fail, and the wasting continued to increase; œdema of the lower extremities set in, and four months after the opera-

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tion death took place. *Post-mortem* report: shrinking of kidney, but otherwise nothing abnormal.

18. Kosinski.—143 cm. (4 ft. 9 in.) ileum; gangrene from hernia; death from collapse.

19. Muller.—Twelve years' old boy; 150 cm. (5 ft.) ileum, cæcum and colon for invagination. For seven days normal, then rise of temperature and pulse-rate; vomiting, diarrhœa, death. Cause of death, according to Professor Ziegler's view, filling of the intestine with air and fluid.

20. Kocher.—160 cm. (5 ft. 4 in.) ileum; gangrene; recovery without disturbance.

21. Budberg-Boeninghausen and Koch.—175 cm. (5 ft. 10 in.) ileum, cæcum with appendix and ascending colon; artificial anus formed; closed two and a half months after operation; recovery without disturbance.

22. Wullstein.—175 cm. (5 ft. 10 in.) ileum for strangulation; recovery without disturbance.

23. Schwalbach.—183 cm. (6 ft. 1 in.) ileum; recovery.

24. Hinterstoisser.—186 cm. (6 ft. 4 in.) ileum and part of jejunum for incarceration; recovery without disturbance.

25. Schlatter resected, in a man, 192 cm. of ileum for gangrene due to the intestine, protruded through an abdominal wound, being grasped tightly by the skin. Recovery from the operation was uneventful, save for an attack of urticaria, which appeared on the fifth day, disappearing on the 10th. This was probably owing to the interference with the assimilatory area due to the operation. His weight increased in the second month after the operation from 140 to 165 pounds. He was then (two months after the operation) feeling perfectly well, there being no tendency to diarrhœa. An examination of his ingesta and ejecta for ten consecutive days showed, how-

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ever, that his appetite was abnormally great—that, whereas the amount of undigested albuminous material in the fæces was slightly above the normal percentage, the amount of fat lost similarly was very much more than normal. The subsequnt history showed that the man was not fit for heavy work, and that he required much more nutritious food than the working people of his own class doing their full work. Other food caused abdominal pains.

26. Koeberlé.—205 cm. (6 ft. 10 in.) small intestine for four strictures; artificial anus closed after six weeks; recovery without disturbance.

27. Kocher.—208 cm. (6 ft. 11 in.) for tearing of small intestine; recovery; but subject to diarrhœa if not very careful of diet.

28. Dreesman.—215 cm. (7 ft. 2 in.) ileum for gangrene; recovery, but slight diarrhœa.

29. Shepherd.—Man, aged twenty-eight, 234 cm. (7 ft. 9 in.) ileum; after operation thin stools, but increased 40 pounds.

30. Hayes resected 255 cm. (8 ft. 4½ in.) ileum for laceration of mesentery with crush of intestine, in a boy aged ten. During recovery there was a great tendency to diarrhœa, which lasted for eight weeks. At a later period a tendency to diarrhœa recurred. There was also occasional vomiting, and the patient suffered from chorea.

31. Fantino.—In a woman, aged sixty, 310 cm. (10 ft. 4 in.) ileum for gangrene from incarceration, healing by first intention. The further study of the nutrition in the intestinal canal showed that the same was not complete. Substances introduced appeared rapidly in the stools, which were also frequent and rich in nitrogen, fats and water. Nevertheless, in the beginning, increase of weight; also, after a year no wasting, since the loss was compensated for by increase of nutritive materials

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32. Ruggi.—In a boy, aged eight, 330 cm. (11 ft.) small intestine for circumscribed peritonitis; recovery and good health two years after.

33. Obalinski.—365 cm. (12 ft. 2 in.) (practically the entire); death in 22 hours.

In analysing these cases, we find that death quickly followed the operation in nine cases. Three survived for about four months.

As regards the site of intestine removed in the 21 cases which recovered—in two it consisted partly of colon, so that that it is not to be wondered at that ill effects were absent in these subsequent to the operation. In one, ileum with a portion of jejunum—how much is not stated—was removed, the total amount being 186 cm. In this case no ill results followed. In the remaining cases it is, as a rule, expressly stated that it was ileum which was removed, so that, generally speaking in analysing these results, we should remember that it is resections of the ileum with which we are principally dealing.

One of the most striking features in the subsequent history of those who survive is that whereas some showed symptoms of intestinal disturbance, chiefly in the form of a tendency to diarrhœa, these have been absent in Ruggi's case in which the greatest length of intestine—330 cm. (11 ft.)—has been successfully removed. Leaving for a moment this case aside, we find with regard to the others that if we take a length of 200 cm. (6 ft. 6½ in.) as a dividing line, they pretty nearly fall into two classes. Thus, in the seven cases which showed subsequent disturbance, the length of the intestine removed was over 200 cm., with two exceptions. In one of these (Braun) the length of intestine removed was only 137 cm. (4 ft. 6 in.), but here there was the complication of contracted kidney, so that much weight cannot be laid on it. In

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the other (Schlatter), the amount removed fell short of 200 cm. by only 8 cm. (3 in.); and in that case, too, it is distinctly stated that the intestine was measured after it had considerably shrunken. The 14 cases which showed no untoward symptoms had lost less than 200 cm., with one exception; and in this case (Koeberlé) the amount removed exceeded the standard by only 5 cm. (2 in.). The teaching of clinical experience in adults would thus seem, in cases uncomplicated by other lesions, to point towards 200 cm. as being the limit about which the danger line fluctuates. In adults, when the intestine removed is less than this, intestinal disturbance will probably be absent; when greater, present. Children must apparently be placed in a different category, for in a child aged eight 330 cm. have been removed without interference with nutrition or intestinal disturbance. The explanation seems to lie in the circumstance pointed out by Bonari—that in those animals which showed no intestinal trouble after operation a marked hypertrophy of the intestine was found to have taken place. It is easy to understand that such hypertrophy will occur much more readily in a child than in an adult, and in this probably lies the key to the mystery that, in the most extensive resection ever done, no disturbance of digestion followed, or possibly Ruggi's case had an abnormally long intestine. Another very remarkable fact is also brought to light—namely, that, even in those cases where diarrhœa occurred, nutrition could still be kept up to a good level by giving an abundance of nutritious food.

If, now, we accept Treves' measurement of 22 ft. 5 in. equal 683 cm. as approximately accurate, and take 200 cm. as the limit beyond which we cannot safely go in removing portions of the intestine, we see that the latter is considerably less than one-third of the total length. Thus,

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Senn is the most accurate of the experimenters as regards his deductions in reference to man, for he it was who asserted that resections of over one-third of the small intestine are likely to be accompanied by grave digestive disturbance, probably terminating in death.

In conclusion, I would point out that, although the interest of the subject is considerable, the question of exactly how much intestine may be removed without damage to nutrition concerns more the physiologist than the practical surgeon. The latter in these cases is confronted with a problem which admits of but one answer. His patient is in imminent danger of death, and the surgeon's first duty is to save his life. If he is dealing with gangrenous intestine, as is most commonly the case, he must remove the whole of it. Whether it measures a few inches more or less than 200 cm. he will not stop to inquire; the leaving behind of the smallest portion of gangrenous gut means death; its complete removal may mean life. When he has got his patient safely back to bed after the operation, he may, in his leisure moments, measure the intestine removed, and assist his prognosis as to the ultimate result by remembering the points which I have here endeavoured to bring forward.

Mr. T. Myles said the paper was one of the most interesting communications ever made to that Section of the Academy. It illustrated in a most striking way the progress made in recent years in that department of surgery. The case exemplified the extraordinary resisting power of the human body. If they had not seen the little boy they could scarcely have believed that a waggon bearing a load of one and a half tons could have passed over him without crushing him to death; yet apparently it produced only laceration of the mesentery. The case also illustrated the extreme difficulty of accurate diagnosis—a difficulty which was increased in the present case by the fact that the intestine was not ruptured. Recently a

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man, leading a restive horse attached to a heavy dray through a narrow archway, slipped, and was caught between the wall and the dray. When brought to the Richmond Hospital he had no symptoms of laceration of the intestine, except vomiting of blood and shock. There was no tympany, no rigidity, and the area of hepatic dulness was not obliterated. Shortly afterwards there were symptoms of intestinal hæmorrhage. The man died 24 hours later, and the *post-mortem* showed the intestine cleanly cut across. The spine was severed at the lumbo-sacral junction, and the right common iliac vein was cut across. Possibly the symptoms were masked by the collapse developed as a result of the injury. As to the non-appearance of the button, the fact that it might be still in the gut was not of much importance, although it might give rise to the diarrhœa. There could be very little doubt that the boy was steadily emaciating, and this, if continued, would ultimately mean death.

Professor McWeeney said the very swollen appearance of a good deal of the resected portion of the gut seemed to be due to hæmorrhage into the coats, but the microscopic examination showed that the hæmorrhage was in reality slighter than the naked-eye appearance indicated. The microscope showed congestion of both lymphatic and blood vessels, and the most striking œdema of the coats of the intestine which he had ever seen. A point which struck him in examining a series of sections was what he might describe as the asepticity of the removed bowel. The micro-organisms were few and far between, and there was no tendency to migration into the peritoneal cavity.

Mr. Lentaigne discussed the case. He understood that it was not treated in any way.

After some remarks by Professor White, Dr. Lane Joynt said Murphy's button was frequently made of aluminium, and the portion of the abdomen occupied by the bowels was the most opaque part of the body, so that it was quite possible for the button to be inside, and a Röntgen ray photo fail to disclose it.

Dr. Travers Smith said he was inclined to think that the diarrhœa was caused by the incomplete digestion of the carbo-hydrate portion of the diet. On account of the removal of part of the intestine and, with it, of so much of the succus entericus, carbo-hydrate digestion could not be as active as formerly. The undigested food would undergo decomposition, with the formation of substances which would bring about diarrhœa. It was interest-

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ing to note that the diarrhœa did not ensue until a considerable amount of food had been given. If it were of mechanical origin why should it not have come on at once?

Mr. Blayney, in reply, said that, as regarded the treatment of the mesenteric stump, seventeen hours had elapsed from the time of injury until operation, and this was quite sufficient for formation of clot. Concerning the button, several photographs were taken, and to try the capacity of the button one was placed on the front of the abdomen, and was found to throw a very definite shadow. He thought Dr. Smith had laid too great stress on the carbo-hydrate food as a cause of the diarrhœa. Might not the chorea from which the boy was at present suffering have something to do with the diarrhœa

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DOUBLE PRIMARY JUVENILE CHRONIC GLAUCOMA.

[Read in the Section of Surgery, December 7, 1900.]

Mr. Arthur H. Benson related a case of this disease. J. M., aged sixteen, a native of Dublin, was admitted to the Royal City of Dublin Hospital, under Dr. Lane, on account of anæmia. He noticed her sight defective, and asked me to see the case, when old-standing, simple chronic glaucoma was discovered. *Right Eye—Vision* = 0, T + 1, very deep glaucomatous cup (about 1·5 mm.), with a halo round it; pulsation of retinal arteries; fundus otherwise normal; corneal diameter, 12 mm.; anterior chamber normal, pupil semi-dilated, slight nebula of cornea, and partial opacity of the posterior pole of the lens. *Left Eye*—Vision = $\frac{6}{18}$, Ja″ 8, T + ?; deep cup in disc (about 1 mm.), with a halo round it; pulsation of retinal arteries; fundus otherwise normal, and media all perfectly clear; corneal diameter, 11 mm.; ant. ch. normal and pupil rather wide, but acting freely to light and accommodation.

The field of vision showed extreme contraction at nasal side, with total loss of the superior temporal quadrant, and an island of visual field, separated from the central field in the inferior temporal quadrant. The tension was never, while under my observation, very high, but it varied very remarkably, being at one time higher in one eye, and at another time higher in the other eye.

Primary glaucoma being essentially a disease of advanced life—only one half per cent. occurring in individuals under twenty years of age—makes this case a very rare one from that point of view. Priestley Smith, in his monograph on Glaucoma, written in 1879, states

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that the youngest person in whom he had seen it was a woman aged thirty-one.

Mr. J. B. Story said he had under his care some years ago, at St. Mark's Hospital, a woman, aged eighteen, almost blind in both eyes from simple primary chronic glaucoma. With the exception of Mr. Benson's, that was the youngest case he had seen. As to the cause, it was conceivable that in early or intra-uterine life she may have had a keratitis which interfered with the excretion of the aqueous, thus causing increased pressure.

Mr. Lentaigne asked for particulars as to treatment and prognosis.

Mr. Benson, in reply, said one eye was absolutely blind, and the field of vision of the other was very limited. He had no doubt it also would become blind. What he proposed to do was to employ myotics for some time, and then, if the field were stationary, to do nothing more, because operation would not improve, and might rapidly deteriorate the field. If the field got narrow the case would be desperate, and probably iridectomy should be done. He remembered the case mentioned by Mr. Story, an interesting point in which was the probable association of mental trouble with the attack. In his own case the girl was very neuralgic, and it was quite possible that some mental excitement had something to do with the onset.

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EXPLANATORY NOTE.

FIG. 1—**Cerebral Topography.**—The distance between the nasion and inion is first carefully ascertained by measuring along the middle line of the head. It is then divided into four equal parts, which are indicated by means of an aniline pencil. Reckoning from before backwards, the nasion corresponds to zero; the first sagittal point above this will represent 25 per cent., the second point 50 per cent., and the third 75 per cent. of the naso-iniac distance.

From the orbito-temporal angle another line is drawn to the junction of the third and fourth segments of the naso-iniac line. As it is found to correspond to the horizontal limb of the fissure of Sylvius in the greater part of its extent it is called the *Sylvian line.* Its posterior extremity will be found as a rule to overlie or very closely approximate the external parieto-occipital fissure.

If a line be drawn from the junction of the first and second segments of the naso-iniac line to the centre of the external auditory meatus it will be found that its point of intersection with the Sylvian line will overlie the Sylvian point.

To find the Rolandic fissure, take a point (superior Rolandic) three-quarters of an inch behind the centre of the naso-iniac line. A second point (lower Rolandic) is found by erecting a perpendicular to the upper border of the zygoma through the pre-auricular point to meet the Sylvian line. Should the upper border of the zygoma be difficult to determine the pre-auricular perpendicular may be erected on a line connecting the centre of the infra-orbital margin with the centre of the external auditory meatus. The *Rolandic line* is obtained by connecting the upper and lower Rolandic points.—*Author's method.*

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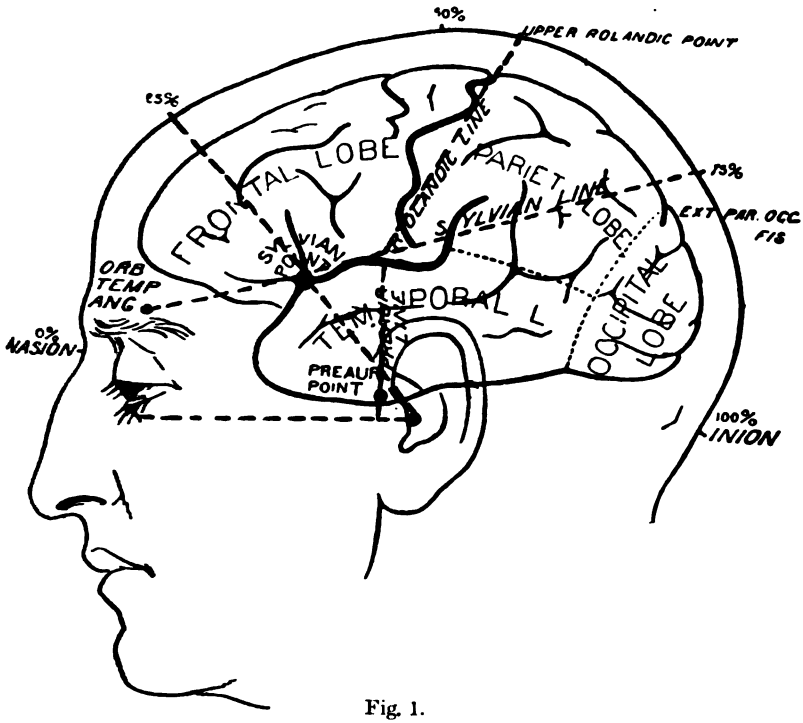
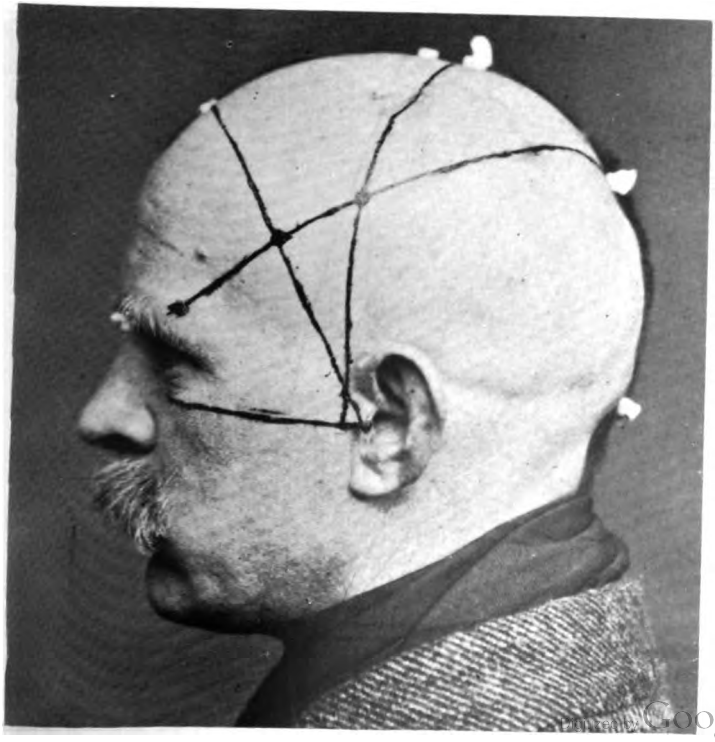


Fig. 1.



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CASE OF DEPRESSED FRACTURE OF SKULL CAUSED BY A SHELL-WOUND AT THE BATTLE OF COLENSO.

[Exhibited in the Section of Surgery, January 18, 1901.]

Mr. E. H. Taylor exhibited a case of above, and said the patient, Private T. M'C., Royal Dublin Fusiliers, was wounded by an exploding shell as he was in the act of kneeling to shoot, at the Battle of Colenso, December 15th, 1899. The wound was situated over the left parietal region of the head. He was rendered unconscious for a few moments, but remembers a combatant officer dressing him on the field, after which he walked to an ambulance about a mile distant. On December 17th he was sent by train to Pietermaritzburg, where he came under the care of Dr. H. B. Maunsell. At this time he had partial paralysis of the right lower extremity and complete paralysis of the right upper extremity. Two days subsequently convulsive twitchings appeared in the face, he became unconscious, and Dr. Maunsell immediately decided to operate. He found a compound depressed fracture of the skull; the inner table was fractured more extensively than the outer, and some splinters of bone were embedded in the brain matter. Two trephine holes were made in order to facilitate the removal of the depressed fragments, in addition to which there was in the wound a large amount of clotted blood. A good recovery followed, but during convalescence the patient contracted a severe attack of enteric fever. He finally left Pietermaritzburg on the 5th April following and was invalided home. Shortly after his return to Dublin he suffered from the effects of too much drink; he threatened to do away with

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his sister, and, in consequence, was committed to the Richmond Asylum, where he still remains. His mental state, however, has greatly improved.

I am indebted to Dr. Norman and to Dr. Rambaut for having an opportunity of examining this man, as I was anxious to confirm the results of certain investigations which I recently made in connection with the topography of the principal convolutions and fissures of the brain.

On examination I find a deep depression over the left parietal region; its edges are smoothly rounded; they are not very steep, but slope gradually inwards. The tissue lining the depression is of a cicatricial character, very adherent and somewhat sensitive to firm pressure. Three linear scars are seen, radiating from the depression into the surrounding scalp The paralytic symptoms are very sharply localised, being limited to the forearm, wrist, and hand of the right side. In these parts no voluntary movements whatever are to be observed.

With Dr. Rambaut's assistance I have mapped out the Rolandic fissure on this man's head by the method which I have recently adopted, and which is published in the last volume of the "Transactions" of this Academy. I find that the middle of the fissure apparently crosses beneath the depression, and this is what one would have expected *a priori*, bearing in mind the muscles which are paralysed and the fact that the middle portion of the Rolandic area is that which presides over voluntary movements in the upper limb. We have here, then, a case which affords strong support to the more modern views which are held regarding cerebral localisation, and in addition I am very pleased to have had such an excellent opportunity for confirming the results of my investigations on the living subject.

As to treatment, I do not think it likely that any opera-

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tion would be calculated to relieve the paralytic symptoms which we find in this case, as there can be little doubt, from what we have heard of the history, that a destruction of cerebral tissue has taken place, and probably over the area which presides over the paralysed muscles. However, I think the case should be closely watched, and if any symptoms of cortical irritation, such as epileptiform attacks, appear, then, of course, an operation might be advisedly contemplated; still one cannot lose sight of the fact that the result of such operations is not invariably satisfactory. No doubt, an immediate benefit of variable duration is often observed, but there is a tendency for a recurrence of the epileptiform attacks, as I have noticed in some cases under my own observations, and in the records of others which have been published from time to time.

Mr. T. Myles agreed with Mr. Taylor that the patient's symptoms were due to an actual loss of brain substance, and would not be relieved by operative interference.

Mr. J. S. M'Ardle said that on examining the man's scalp it occurred to him there was more than a depression—there was an osteitis. He yielded on pressure over the hand and wrist centre, which he believed were at the lower edge of the depression, but not corresponding to the depressed point. No doubt there may have been destruction of brain tissue, but there might be other causes for the present condition. What was to hinder the presence of unabsorbed blood? Although, as a rule, the convulsive seizures were followed by the paralysis, still exceptions occurred. Taking into account the practical absence of risk from operation, he thought it unsurgical not to make an attempt to relieve the patient.

Mr. G. Jameson Johnston believed the dura mater, cortex, and inner table of the skull were firmly united in one cicatrix, and that would account for the present condition.

Dr. Dawson said he had elicited from the patient that his speech was very much affected at the beginning. Did Mr. Taylor regard that and the leg paralysis as due to the effusion of blood found at

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the operation? The man did not seem to have been paralysed for some time after receiving the injury, for he was able to walk off the field. He thought the cicatrix too high for the forearm and wrist centres. As to actual destruction of brain tissue, it seemed to him very unlikely that so defined a lesion was due to a tearing up of the cortex. It was more likely that there was a piece of bone or a mass of cicatricial tissue pressing on an area of the brain than that a limited portion of the brain was removed without injury to surrounding parts.

Mr. Lentaigne agreed with Mr. M'Ardle both as to the situation of the hand and forearm centres and as to the advisableness of operation. The depression itself was tender, and the bone between the depression and the ear was very tender, so that the presence of some inflammatory disturbance was not unlikely.

Mr. Taylor, in reply, gave his reasons for not thinking operation advisable. First, there was the history from Dr. Maunsell, who saw the man in South Africa. Then they knew that the symptoms improved considerably after the operation, and since he came to Dublin the symptoms had also improved. In South Africa he had a defect in his speech, which passed off. The loss of power in the legs had also undergone considerable improvement. The paralysis from which he suffered at present was so well localised that he thought the chance of doing good by operation was very remote. As to the position of the centres for the upper extremity, the lower part of the depression went down pretty well over this area of the cortex. If they allowed the area lying beneath the lower edge of the depression for the mouth, &c., they had the depressed area overlying the centres for the upper extremity, and there was only a narrow portion of the outer surface of the brain above this connected with the lower extremity. He agreed that the lower part of the depression came down to the centre for the hand and fingers. With reference to Mr. M'Ardle's remarks as to blood-pressure accounting for the paralysis, he thought it improbable. At the time of the operation a quantity of blood-clot was removed, and it was unlikely that a fresh hæmorrhage had occurred. Probably there was a good deal of matting of the dura mater, but he did not think any conclusion could be drawn from it, as he considered that the cortex beneath was destroyed.

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SOME PRACTICAL POINTS IN THE DIAGNOSIS AND OPERATIVE TREATMENT OF PERFORATED GASTRIC ULCER.

By R. CHARLES B. MAUNSELL, M.B. (Dubl.), F.R.C.S.;
Surgeon to Mercer's Hospital, Dublin.

[Read in the Section of Surgery, March 7, 1901.]

The subject of the diagnosis and treatment of perforated gastric ulcer is one which has received considerable attention within the last seven years. It has excited the interest of both physicians and surgeons, and caused many instructive papers and statistical tables to appear in our journals.

I think it would serve no useful purpose for me to weary you with elaborate lists of cases culled from these journals, more especially as most of the initiated know that conclusions drawn from such lists would be far more encouraging than the most optimistic of us would expect. I cannot, however, altogether get rid of statistics, as we must start with some idea of what has been claimed for the operative treatment of this serious accident.

Previous to the year 1893 Mikulicz collected 35 cases, of which only one recovered, but within the next three years he was able to collect 68 cases, with 47 per cent. of recoveries.

In the three years 1895 to 1897 A. E. Barker collected from English sources 107 cases, with 49 per cent. of recoveries, and Mayo Robson last year gave a list from all sources of 429 cases, with 45 per cent. of recoveries.

I do not lay much stress on the foregoing lists, although

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fairly extensive, but I would rather trust to the following small lists by individual operators, recording honestly both failures and successes:—

A. E. Barker up to the end of 1897 had operated on 9 cases with 3 recoveries, or 33 per cent. Mayo Robson up to 1900 had operated on 6 cases, with 50 per cent. of recoveries, and A. B. Mitchell, up to the same date, had operated on 6 cases with a similar result. Mitchell also gives a very interesting list of all the cases, including his own, treated in Ulster, which amount to 14, with 7 recoveries, or 50 per cent.

We may, therefore, close the old century with the assurance that when failures and successes are added we can claim between 45 and 50 per cent. of recoveries from an accident which but seven years ago was practically a death warrant. Half the total is good, but let us see whether by carefully examining the past we can get a hint how to save the other half in the future.

The first thing which strikes us on analysing the statistics is that the time lost between perforation and operation is of vital importance. In Barker's English list 42 cases were operated upon within 12 hours with 76 per cent. of recoveries. After 12 hours the recoveries were only 25 per cent. In his personal list 5 cases were operated upon within 12 hours, with 60 per cent. of recoveries; 3 were operated upon after 24 hours and all died.

In Mayo Robson's personal cases 3 were operated upon within 24 hours and recovered; 3 after 24 hours and died.

In the Ulster list 8 cases were operated upon within 12 hours, with 64 per cent. of recoveries; 6 were over 12 hours, with only 33 per cent. of recoveries. Earlier diagnosis is, therefore, the first hint we get for the future.

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We cannot read the literature of this subject without noticing a wordy war which is being waged as to whether men or women suffer more often from gastric ulcer and its dread complications. The practical lesson we learn from this discussion is that gastric ulcer is a common disease of both sexes.

On adding Barker's and Mitchell's lists we get 108 cases of which the sex is stated, and of this number 93 were women and 15 men. This sounds very encouraging for the male sex, but when we come to look at the termination of the 15 cases we find that only 3 recovered. We have not far to go for an explanation, for we find that these cases fall into the category of cases undertaken after the lapse of 12 hours, and we see that this excessive mortality in the male sex is wholly avoidable if we take, as a second hint, to think just as much of gastric ulcer when called to an acute abdominal case in a man as we would if we were called to see an anæmic girl under like conditions. The cases which I bring before you this evening illustrate the foregoing points. Two were men and two were women; two were operated upon within 13 hours, and of these 1 recovered and 1 died, but I must say that it is open to doubt whether the fatal case had not perforated many hours before the time I count from. The other two were operated upon respectively 19 and 31 hours after perforation, and both died.

Case I.—On November 8, 1899, at about 5 p.m., my colleague, Dr. Lumsden, called for me to see a female patient, in consultation with him, whom he had just admitted to Mercer's Hospital, as he had diagnosed perforation of a gastric ulcer. Dr. Lumsden gave me the following history:—

Mrs. L., forty years, mother of several children, had considered herself in good health until a fortnight ago, although Dr. Lumsden was aware that she suffered from mitral regurgitation for an indefinite period. During the past fortnight she suffered from

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slight diarrhœa and from occasional pain in the upper abdomen, with vomiting after meals; there had been no blood in the vomited matter.

On November 3rd, at 3 p.m., she was suddenly seized with acute pain in the epigastrium and left iliac region, which lasted about four hours. This pain followed on an attack of vomiting.

On November 4th and 5th she felt better, except for diarrhœa, and on November 6th and 7th she attended to some household duties.

On November 8th she arose as usual, and while standing cutting bread at 9 a.m. she was seized with acute pain in the epigastrium, and became weak and went to bed. She took some brandy which made her feel stronger, but the abdominal pain became much worse and more uniform. At 3 p.m. Dr. Lumsden was sent for, and immediately recognising her condition had her removed to hospital.

When I saw her with Dr. Lumsden her condition was as follows:—She was a fairly strongly built woman; her face had a peculiar, anxious, drawn and dusky appearance; temp., 98·4°; pulse, 104; resp., 20; urine acid, and contained no albumen. There were no signs of intrathoracic disease except a slight mitral regurgitant bruit. The tongue was coated, but moist. The abdomen was distended, rigid, and moved very little on respiration. The chief rigidity and tenderness on pressure was over the left lumbar and iliac regions and epigastrium. On percussion, there was comparative dulness in the flanks, and uniform tympany in front, and only a very narrow line of liver dulness.

I agreed with Dr. Lumsden as to the diagnosis of perforative peritonitis, but was not as confident as he was as to its gastric origin. We, of course, advised immediate operation, and before 8 p.m. I opened the abdomen, that is eleven hours after the last acute attack of pain.

Operation.—I elected to begin with a three-inch incision between the umbilicus and pubes, and immediately a rush of gas and dirty yellow fluid, containing a quantity of thick purulent-looking matter, having a peculiar nauseating smell, escaped from the peritoneal cavity, and distended and intensely injected coils of small intestine bulged into the wound.

The left hand was now passed into the abdominal cavity, and the tubes and appendix were examined, and, being found healthy, the hand and wrist were thrust upwards to guard the intestines, whilst

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the abdominal wall was slit with a strong scissors to within a short distance of the ensiform cartilage.

I now had no difficulty in finding a perforation as large as a threepenny piece on the anterior wall of the stomach, very close to the lesser curvature, and high up, just where the œsophagus enters. The stomach wall, for about half an inch around the perforation, was indurated and friable. The remainder of the operation was done as I will describe later on, except the closure of the abdominal incision, which, in this case, was effected by suture in layers with silk sutures. The completed operation (*i.e.*, dressings, &c., applied) lasted fifty-five minutes.

The case after operation ran an uneventful course, and feeding by the mouth was begun on the fourth day, as the rectum was becoming irritable. On the seventh day the patient seemed very well, the temperature, &c., having been practically normal up to this date; but on the morning of the eighth day the temperature ran up to 102°; pulse, 140; resp., 28; and I determined to look at the wound.

On removing the dressings I found that the upper part of the wound had become septic, and, fearing deeper complications, I removed the stitches and re-opened the wound as far as the umbilicus, but found that the peritoneal cavity was firmly sealed off by adhesions, so, having removed the buried silk sutures, I plugged the wound, hoping that it would heal by granulation.

Next day the patient seemed much better, but on the evening of the tenth day the temperature again was 102°; pulse, 140; resp., 32; and we now discovered that she had developed pneumonia of the right base, and, despite all we could do, she died the next evening, having lived eleven days after the operation.

Post-mortem.—Septic pneumonia of the right base, hypostatic left base, mitral valves showed old vegetations. In the abdomen the peritoneal cavity was perfectly closed off from the abdominal incision by adhesions, and there was not a trace of pus or any fluid, or sign of peritonitis, the intestines, &c., showing normal-looking, shiny, peritoneum; the lesser sac was normal. At the upper angle of the open wound, to the right of the falciform ligament, was a small collection of less than a drachm of pus, but this was connected with the open wound, and was not pent up in any way.

The stomach was removed, and the perforation was found firmly closed. Opposite the site of the perforated ulcer was

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another ulcer on the posterior wall, evidently produced by contact. Both ulcers were of the round, "punched out" or "acute" variety.

Case II.—K. B., aged twenty-three, servant girl, had suffered from anæmia and dysmenorrhœa for some months, and for some weeks from vague pain and uneasiness in the stomach, with occasional vomiting.

On December 9th, 1899, she was sweeping a room, when she suddenly felt great pain in the abdomen and became faint. Her illness was supposed to be due to the onset of menstruation, which was a week overdue, and that evening she was treated by hot hip baths.

Next day peritonitis was recognised, and she was treated by opium stupes, opium by the mouth, and fluid diet.

On December 10th, at 10 p.m. (thirty hours after the onset of her illness), I was asked by my colleague, Dr. Ledwich, to see the case with him in hospital, as she had meanwhile been transferred to his care in that institution.

On Examination.—Temp, 98·4°; pulse, 140; resp., 36; urine, 1040; no albumen. Complained of intense pain all over the abdomen. Her face was very drawn and anxious, tongue furred and brownish, but not dry; abdomen very much distended and uniformly tympanitic in front, with dulness in the flanks; liver dulness was absent.

We considered it to be a case of perforated gastric ulcer, and, as she was fairly strong in spite of the rapidity of the pulse, and was very anxious to have every chance given to her, I decided to operate, having informed all those concerned what a forlorn hope such a procedure must be.

The abdomen was opened at 11 p.m. (just thirty-one hours after perforation). The incision used was one between the ensiform cartilage and umbilicus, with a transverse cut through the left rectus. The perforation was easily found, and was in the same position and of the same character as in the first case. The operation lasted one hour.

The patient rallied fairly from the anæsthetic, but died suddenly three hours after the operation.

Post-mortem.—Single ulcer of "acute" variety. The lesser sac of peritoneum was normal.

Case III.—E. P., aged thirty-two, drayman, had been attending Guinness's Dispensary for some time, where he was treated by

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my colleague, Dr. Lumsden, to whom I am indebted for the following history :—

Patient, who is a tall, bony-looking man, had been complaining of pain in the region of the stomach for several weeks, and periodical vomiting of large quantities of fluid and undigested food. The pain was not connected with meals, and the vomiting only occurred every second or third day, and the vomit contained no blood. The patient had wasted very much during the last two months.

On examination, a dilated stomach was found, and treatment was instituted for his relief.

On 18th April, 1900, the patient presented himself at the dispensary with the same signs as before, and, in addition, great tenderness in the epigastric region and rigidity of the recti. He was ordered to lie up and be attended at his home.

At 10 30 p.m. Dr. Lumsden was sent for, and found that he had partaken of some fluid food at 2 p.m., and from that until 10 p.m. vomited occasionally. At 10 p.m. he took a drink of cold water, and felt a sudden pain in the epigastrium. Dr. Lumsden found him rather collapsed, with hands and feet cold, and face anxious looking; his pulse, 78; temp., normal; the abdomen rigid, and liver dulness decreased, but not lost. A hypodermic of morphia was administered, and instructions left to send for help if the pain did not abate.

Next morning, April 19th, Dr. Lumsden and his colleague, Dr. Copley, saw the patient, and the only change in his condition was that the abdomen was more rigid, so they had him conveyed to hospital.

I saw him in consultation with Dr. Lumsden and the other members of the staff and Dr. Copley, and found his condition as follows:—Temp., 98·6°; pulse, 100; resp. somewhat quickened (actual frequency not recorded); face drawn and anxious, tongue covered with a brown fur, and he complained of great pain in the epigastrium and over the abdomen generally. The abdomen was not markedly distended, and seemed fuller in the left hypochondriac region than elsewhere.

On palpation, the muscles were rigid, and pain was elicited chiefly in the epigastrium. On percussion, there was relative dulness in the flanks, the front of the abdomen was tympanitic, except in the epigastrium, which was dull; but the tympany was not uniform, and a dilated stomach could be mapped out, and

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succussion elicited by careful manipulation. The liver dulness was much decreased.

The opinion of the consultants and of the patient himself was that palliative measures should be tried, and another consultation held in the afternoon.

At the second consultation we found that the patient had vomited dark, "peritonitic" vomit in considerable quantity, the epigastric dulness was gone, the abdomen was more distended, and the tympany more uniform, so he was removed to the theatre, and I opened his abdomen at 5 p.m. (nineteen hours after perforation). The diagnosis made before operation was stricture of the pylorus complicated by perforated gastric ulcer. The incision used was the same as in the last case, except that the transverse incision divided the right rectus. The perforation, of large size, was easily found within an inch of the pylorus. The pylorus was firmly bound down and thickened, and on the digital examination through the enlarged perforation, was found tightly strictured. A longitudinal incision was made from the perforation through the stricture, and both ailments treated at the same time by performing a pyloroplasty. The operation was very difficult, as the pylorus could not be brought up to the wound. The line of suture was reinforced by an omental graft, and the operation completed as in the other cases. The completed operation lasted one hour and twenty minutes. This patient did well for a few days, but then black vomit returned and severe diarrhœa, and he died five days after the operation.

Post-mortem.—Abdominal incision healed and apparently aseptic. No fluid of any sort in the peritoneal cavity, but the peritoneum was sticky and injected, showing peritonitis. The lesser sac was normal; the pyloroplasty was perfectly sound, and two fingers could be passed through the pylorus; the stomach was large, thickened, and contained three other ulcers—two on the posterior wall and one on the anterior. They were all of the "acute" variety.

Case IV.—W. N., aged twenty, porter, had always been thin and delicate, and never had any appetite for breakfast. During the last six weeks he had felt slight constant pain in the region of the stomach, and he had an attack of vomiting four days ago.

On April 20th, 1900, he went to work as usual, and at 10 30 a.m., during some exertion, he felt a sudden pain in the upper part of the abdomen, and he came to hospital. He was admitted, but it

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was not considered necessary to send for the physician on duty, until the evening, when the boy seemed worse. Dr. Lumsden then saw him, and sent for me in consultation at 8 p.m.

Condition—Temp., 98°; pulse, 84; resp., 34; tongue furred, but moist; short cough, no vomiting; bowels moved during the day. His face looked very distressed and pinched. He complained of great pain in the epigastrium, and the abdomen was very rigid, especially in the upper part, and moved very little on respiration. On percussion, there was relative dulness in the flanks, and liver dulness was absent. There was nothing abnormal to be found in the chest.

We diagnosed perforation of a gastric ulcer, and I opened his abdomen at 11 p.m. (twelve and a half hours after perforation).

Operation.—The incision was the same as in Case III., and a perforation the size of a quill was found near the pylorus. The operation was finished like the others, and lasted one hour and ten minutes.

On the fourth day after operation he showed signs of a localised patch of pneumonia at the upper part of the right lower lobe, and the temperature and pulse rose.

On the ninth day the stitches were removed, and the abdominal wound was found healed. The chest was explored, with a negative result.

On the fourteenth day there were signs of a cavity in the lung, and the sputum was abundant and contained elastic tissue and septic organisms, but no tubercle bacilli. From this date he rapidly improved, and was allowed up in a month after the operation; and is to-day in better health than he ever was before, and has no signs of anything abnormal in either chest or abdomen.

Four cases are not enough to draw deductions from in ordinary ailments, but considering the comparative rarity of this one, I hope you will excuse me if I appear in anything too dogmatic even when I join my small practical experience with material from current literature. The first thing which concerns us is diagnosis, and the first practical point I have learned is to regard with extreme suspicion the diagnosis of gastric ulcer and perforation as given in the standard text-books. The previous history we may expect to get from these patients would hardly

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satisfy physicians of a few years ago that even gastralgia was present. However, there is always some symptom pointing in an indefinite manner to a gastric source. The onset of perforation is sudden, and frequently takes place during some exertion. In some cases we may get a double onset, as in Cases I. and III., which I consider to have been cases of localised extravasation with subsequent diffusion. The onset is severe, but need not incapacitate the sufferer, as in Case IV., who could walk to hospital. The onset is frequently preceded by vomiting, but not often followed by it. Pain is referred to the epigastrium, but may soon spread to the left or right iliac region; this is not a metastasis, but an extension. The bowels may be either constipated or there may be diarrhœa. There is generally no difficulty or pain during micturition. The amount of collapse is variable, but often not marked, and tends to pass off to a great extent within a few hours. Thirst is not intense until late.

On examination.—Anxious, pinched face, and anxious, restless manner, but no sweating or tossing about. Respiration frequent and shallow, the abdominal respiration being abolished or very greatly diminished. The abdomen is flat in men or nulliparous females, distended in those who have borne children, or who are relaxed from other causes. The tongue is coated with a white or yellowish fur, and is moist. The temperature is subnormal or normal, and the pulse in many cases is remarkably infrequent, in others may be frequent. On palpation the apex beat is displaced upwards and the abdominal muscles are rigid. Pain is complained of on pressure over the upper abdomen. If respiration is stopped pressure can be continued, but as soon as respiration starts again pain is intense and a friction fremitus may be felt.

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On percussion.—Tympany is uniform, except, in some cases, over the stomach, which may retain its peculiar note. Liver dulness is absent or rapidly diminishes. Dulness in the flanks is only a late sign. In abdomens which do not appear distended the abdominal note will encroach unduly, and in some cases very excessively, on the thoracic area.

The points to which I wish to draw special attention to are—(1) The pain, which begins in the epigastrium, spreads, but does not shift its position. (2) There is no pain on micturition, which is a frequent sign in peritonitis of the lower abdomen. (3) Thirst is not intense, and there is no flinging about, as in hæmorrhage. (4) There may be no distension in muscular subjects, the tympanites and free gas being only shown by the encroachment on the thoracic area. (5) The pulse cannot be relied upon in forming an early diagnosis. (6) The statement sometimes made that a "stomach note" excludes perforation is unwarrantable, as a perforated and a collapsed stomach are by no means synonymous terms. (7) Liver dulness is diminished or absent in almost every case.

Having made a diagnosis there is only one treatment—namely, to open the abdomen and perform certain other manipulations suitable to each case. But we are likely to be asked what cases should be operated upon? and at what period should they be operated upon?

The answer to the first question is that every case in which the diagnosis has been made in time should be operated upon, and, further, that every case in which the condition is strongly suspected should be submitted to an exploratory operation.

This term has, I regret to say, become so fashionable, and the operation so common in some quarters, that much discredit has resulted to abdominal surgery; therefore, I

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consider it necessary to define what I mean by exploratory operation. An exploratory operation is one undertaken in a case in which it is impossible to give a definite name to the primary disease, but in which such secondary signs are present as by analogy would lead us to expect a fatal termination if not treated by operation.

The answer to the second question naturally divides itself into two, viz.—(1) The best time is as soon after the diagnosis as an operation can be methodically undertaken. (2) It is never too late, unless the patient is evidently moribund. This latter statement can be easily proved by anybody who takes the trouble to read a few of the cases recorded from time to time.

With regard to the operation, the primary incision is best made in the ordinary way, midway between the umbilicus and ensiform cartilage, and this should be enlarged in any direction in which more room is required, either longitudinally or transversely, by cutting with strong scissors. The perforation in over 80 per cent. of the cases will communicate with the greater sac of peritoneum and can be readily found. If the anterior surface shows no perforation, then the posterior surface can be exposed by tearing through the gastrocolic omentum, thus opening the lesser sac. The next thing is to empty the stomach through the perforation by means of a catheter, and then sew up the opening. Some advise excision of the ulcer, but most operators prefer simple suture. The form of suture I used in my cases was a through and through interrupted silk stitch covered in by a continuous silk stitch, usually called Dupuytren's, and over all an omental graft which adds very little to the time of operation.

The most important part of the operation is the

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cleansing of the peritoneal cavity, and there are some who say this should be done by douching, and some who say it should be done simply by sponging. I think there is very little doubt that in very localised peritonitis sponging with gauze pads is the best, but where the soiling and peritonitis are general sponging does not appeal to me. On the other hand, douching, no matter how prolonged, will not remove the tenaceous purulent lymph from the pelvis and subphrenic regions. I think the right course is to douche, then to carefully wipe out the pelvis, superior surface of the liver, and inferior surface of the diaphragm with large gauze pads held in the hand, not in forceps, and then again a final douching. The best way to do the first douching is to hold up the edges of the wound and pour in saline solution from a jug, gently manipulating the intestines, &c., until all gross material ceases to come away. For the final and more methodical douching the best plan is to take the end of a wide rubber douche tube in the hand, without any nozzle, and passing the hand and forearm through the wound, carry it into the pelvis and douche upwards, and then carry it above the liver on both sides, finally removing as much as possible of the fluid.

With regard to the debated point as to whether we should open the lesser sac in every case, all I can say is that in none of my cases did I do so, and in none of them did subsequent events prove that I was wrong. It is of far more importance in every case, no matter how localised it appears, to carefully pass the hand down into the pelvis and up over the liver, and make certain that these treacherous regions are clean. Drainage is employed by some and not by others, and my personal view of the matter is that abdominal drainage is futile except in cases where there is a distinct abscess cavity walled off

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by adhesions, and my two cases which died without drainage showed at the *post-mortem* that drainage was not required, and would not have brought about any happier result.

There is one very practical point worth noting in the closure of the abdomen, and that is to use through and through fishing gut sutures, as they exert no capillary action between the non-aseptic peritoneal cavity and the wound, and the two cases in which I used this method proved its usefulness. In my first case you may have noticed that I used permanent silk sutures, and to the subsequent infection of them I attribute the death of this patient, who died cured of her ulcer and peritonitis, but subsequently systematically infected from the suppurating abdominal incision.

There are many interesting points in the preparation and after-treatment of these cases, and in the causation and treatment of the numerous complications to which they are liable, but either of these subjects would supply ample material in itself for a paper, and perhaps I have been sufficiently prolix.

Mr. Lentaigne said in a case of his, with an ulcer on the posterior wall, he had failed to find the perforation after the most careful search, and he saw that other operators had met with a like result. Anything which caused delay in the operation added to the patient's danger.

Mr. M'Ardle, after congratulating Mr. Maunsell on the brilliant result obtained, said there were some points on which he disagreed with him. One was the method of reaching the stomach with most ease and completeness. He believed Billroth's oblique incision, cutting through both recti, was the best. It afforded a better union after suture, and gave far more room. He agreed that the most perfect method of suturing the abdominal wall was to pass a silk-worm gut suture of sufficient strength through the entire thick-

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ness. He held that in a patient whose vitality was already very materially lowered, it was not correct surgery to carry out a prolonged operation. When the perforation had existed for some time it gave the patient a much better chance of life to fix the stomach to the abdominal wall. There were two positions in the stomach in which he would not suture at all—(*a*) where the œsophagus joined it, and (*b*) where a fixed pylorus prevented the procedure being properly carried out. In these cases the abdominal cavity should be tamponed. In dealing with the stomach conservative surgery was the truest surgery.

Mr. Croly thought that in extended operations it was the prolonged anæsthesia which caused danger. He was not fond of following anybody's incision, but took the safest route to the point of operation.

Dr. Parsons disagreed with Mr. Maunsell's statement that the pulse was no guide. He had found it an exceedingly valuable guide. He had had an opportunity of watching a couple of cases from commencement to termination. One was a young lady, aged twenty-four years, who was suddenly seized with severe pain in the abdomen one morning at 8 o'clock. He saw her at 9 o'clock, when her temperature was normal; at 9 30 her pulse was 100, at 11 o'clock it was 110, at 12 o'clock 120, and in the afternoon 140. Operation was performed, and the stomach stitched to the abdominal wall because the surrounding tissue was so softened it was impossible to close the opening. In the other case the pulse at 9 30 was 90, at 10 30 it was 100, and the patient was rapidly removed to hospital, and when placed on the operating table it was 120. This steady increase in the pulse rate was a most valuable sign, and one not masked by morphin. Other important points were the sudden onset of violent pain (the acuteness of which varied with the amount of food in the stomach at the time) and absence of liver dulness. The temperature was no guide.

Mr. T. Myles said a few evenings ago a woman, aged twenty-eight years, was admitted to the Whitworth Hospital complaining of abdominal pain. He found her bathed in perspiration. She was vomiting, and was extremely tender to the touch under the ribs on the left side, but the liver dulness had not disappeared. He gathered from the history that perforation had taken place about six hours before. He opened the abdomen by an incision parallel to the lower border of the last rib and found about a pint of tea in the abdominal cavity. There was great difficulty in finding the

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perforation, which was up under the diaphragm. The tissue around the perforation was rotten, and the sutures cut through as fast as they were put in. He douched the abdominal cavity, and incompletely closed the wound, and she did very well for 24 hours. Then her pulse rate went up, but her temperature did not rise. He opened the wound, and evacuated a large amount of serum, and put in a glass tube, but she succumbed within 48 hours. He was convinced that a great many lives were lost because they tried to do too much—*i.e.*, if they merely tamponed the wound many recoveries would take place. The most favourable time for operation was between six and twelve hours after the accident. The shock of an operation before that, added to the collapse, would probably prove fatal.

Mr. Maunsell, in reply, said his point about the pulse was that it was no guide to a surgeon called in to see a case, and who had to decide at once whether he should operate. He would sometimes find the pulse fast, sometimes slow; in a great number of recorded cases he found that the pulse was 68 to 70.

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GUNSHOT WOUND OF HIP-JOINT.

By T. MYLES, P.R.C.S.I.

[Read in the Section of Surgery, March 7, 1901.]

The case on which my very brief communication is based occurred nearly two years ago:—

The subject of it was then chief boatman of the coastguards at Valentia Island, in the County Kerry. When at revolver practice with his comrades, of whom he was in command, he approached the target to examine and record the hits. At that moment one of the firing party, imagining his magazine to be exhausted, threw open the breech of his revolver to extract the empty shells, but unfortunately one shell remained unexploded, and this was accidently discharged, with the result that my patient was shot at a distance of only twelve paces by a regulation navy revolver, throwing a 450 bullet, black powder being the explosive used. The bullet entered the hip behind, traversing the great gluteal muscle about two inches inside the great trochanter.

With the help of his comrades, though in great pain, he succeeded in climbing up a steep path from the beach to the top of the cliff, and was thence conveyed home. He was at once seen by Dr. O'Driscoll, and later by Dr. Mannix of Caherciveen, a Fellow of our College.

These gentlemen advised an immediate operation for the removal of the bullet, but such prompt treatment was totally opposed to the traditions of the Admiralty, and a great lot of blue paper had to be used up before the operation was performed. The wound was dressed with an antiseptic pad, and healed rapidly, so that in a few days only a small scar remained to mark the entrance of the missile. By this time, the necessary routine doubtless having been gone through, the authorities sent a naval medical officer from Queenstown to see the patient and do what was necessary. This gentleman was confident, after an examination, that he felt a bullet imbedded under the skin, and that its removal was merely a matter of skin incision. Accordingly, he cut down on the scar, and, as might be expected, found nothing. I confess that it sur-

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prises m now any man with any knowledge of the penetrating power of a heavy navy revolver, could imagine that at twelve paces distance a bullet from such a weapon would only penetrate the skin. The incision, however, healed rapidly, and the patient was still unrelieved. He now began to develop unpleasant symptoms. His temperature rose to 104° F., his breathing became hurried, and he developed cough with rusty sputum. His leg was flexed at the hip, and any attempt at extension caused great pain. His condition became so alarming that Drs. Mannix and O'Driscoll urged upon the authorities the necessity of getting further advice, and I was accordingly communicated with. I at once suggested the advisability of getting an X-ray photo taken, and being given a free hand by the Admiralty, sent my friend, Dr. R. Lane Joynt, with his apparatus to Valentia to see what could be done. Dr. Joynt reported by telegraph the next day that he had located the bullet, and I at once started for Kerry to operate. On arrival I found the man's condition most distressing. He was in great pain, his thigh flexed, and evidently considerable effusion existed about the hip-joint. The muscles of the hip and thigh were greatly wasted. His face was dusky and cyanosed, respirations were 40 per minute, tongue dry and brown, and temperature 104·5°, pulse very rapid and weak. It was quite evident that he was sinking, and that anything to be done must be done quickly.

That night all the preparations were made, and on the following morning, at eight o'clock, assisted by Dr. Mannix, I operated. Ether was given by Dr. Joynt in his usual skilful manner, and I may here state parenthetically that the administration of the anæsthetic was by far the most anxious part of the operation.

He was anæsthetised in bed, and then carried by his brother seamen from one small room to another not any bigger, and not very well lit, where we had extemporised a table. I made an incision parallel to the fibres of the glut. max. muscle, and exposed the deep muscles and the sciatic nerve. A ligature was passed under the nerve, and it was by means of this pulled to one side. The joint was now opened from behind, and a large quantity of decomposing blood clot and serum escaped. Very little search there exposed the hole in the head and neck of the bone, and a probe passed into it struck the bullet. With a gouge I enlarged the opening, and soon extracted the bullet. With the bullet also I extracted a disk of bone that had evidently been punched out of the posterior aspect of head, and forced into the cancellous tissue.

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The bullet had evidently traversed the edge of the acetabulum posteriorly, and then gone through the head and neck, but had not got more than its tip through the anterior aspect of the bone. On passing my little finger through the aperture I could feel the femoral artery in front distinctly pulsating.

It is quite evident that a most providential lack of penetrating power was responsible for the saving of the man's life. Had the penetrating power been the smallest degree greater, his artery would have been entered, and death from hæmorrhage resulted.

Free douching and free drainage sum up the after-treatment. He is now quite well, and fit for any duty, though the movements of his hip-joint are necessarily somewhat limited.

When I put this case on the list of the Section we were not familiar with the details of gunshot injuries, as unfortunately we are to-day. The war had not begun, and we were not then, as we are all to-day, mourning the loss of gallant friends and kinsmen who have succumbed to the bullets of the enemy, and who have laid down their lives at the call of duty.

I thought, then, that the case would be of interest, but that interest is now necessarily much diminished by the tragic events of the last eighteen months. Still it is of some interest and in some degree instructive.

It illustrates the difference between an old-fashioned and modern projectile. Had this bullet been of the Mauser type there can be no doubt that it would have gone clean through the limb from back to front.

The case is calculated to lower one's respect for the British naval revolver. In the hands of the heroes of fiction a navy revolver does the most terrible execution. At Valentia, however, even at twelve paces distance it could only imbed itself in the bone.

The case also illustrates the value of X-ray aid in obscure cases, and I should like here to express my indebtedness to Dr. Lane Joynt for his great aid on this occasion. He had to carry his apparatus 168 miles by

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rail, then embark it and himself in a Coastguard boat and traverse the stormy waters of the Sound, then extemporise a dark room, which he very ingeniously did by simply waiting till the sun went down, and then having obtained all the available information by the exercise of his special knowledge and skill, he ceased to be an X-ray specialist and became what he always is—a most careful and reliable anæsthetist.

The complete recovery made by the patient was largely due to the unremitting care and attention given him by Drs. Mannix and O'Driscoll during his convalescence.

Reviewing the case after a considerable lapse of time, I think I was justified in trying to save the head of the femur. When I found the head penetrated, and the joint cavity full of pus, I was at first inclined to resect the head, but a resection of the hip-joint is, in a man of his age, not a hopeful operation, and I believe that the danger of infection of the large cut surface of the bone by the pus in the joint was greater than that incurred by a mere removal of the bullet with free drainage. This latter was insured by the position of the wound and by a drainage tube half an inch in diameter. Through this the wound was douched daily by Drs. Mannix and O'Driscoll, and to their skill and attention in the after-treatment the successful issue of the case was largely due.

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THE SURGERY OF CHRONIC AILMENTS OF THE STOMACH.

By A. B. MITCHELL, M.B., M.D., B.Ch., R.U.I., F.R.C.S.;
Surgeon, Royal Victoria Hospital, Belfast;
Surgeon to the Ulster Hospital for Women and Children.

[Read in the Section of Surgery, May 10, 1901.]

It has often seemed to me to be a curious thing that, whilst surgeons have for many years, without hesitation, explored the pelvic cavity for chronic or painful affections of the uterus and ovaries, or attacked the deep-seated kidney with the greatest equanimity, an organ so easy of access and so tolerant of interference as the stomach should have been comparatively neglected.

Of late years, however, this preserve of the more conservative physician has been invaded with remarkable success.

The triumphs of modern surgery in dealing with perforated gastric ulcer have been so ably presented to this Academy at a recent meeting by Mr. Maunsell, that I do not propose to occupy your time with any reference to that subject, except in so far as the actual conditions met with by me in those cases in which I have been called upon to operate supply suggestive material with a distinct bearing on the question of early exploratory operation.

I have performed laparotomy for perforating ulcer 9 times. In all cases the ulcer was found without much difficulty, and closed, in the earlier cases by a double row of sutures, in the last four by a single row. Of the 9 cases 5 recovered; of the last six 5 are living and well to-day, showing clearly enough that a single row of Lembert's

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sutures efficiently placed is quite satisfactory. These 9 cases have a number of points in common—

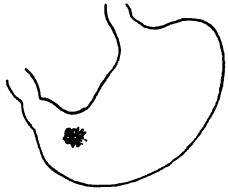
1. The ulcers were all on the anterior surface.

2. They were decidedly more common near the extremities of the stomach.

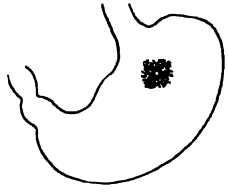
3. They were all surrounded by a zone of induration varying in diameter and thickness, and for the most part the size of this zone was directly proportionate to the duration of the symptoms.

4. All these cases were complicated by adhesions, in most instances to the liver, in other cases to the anterior abdominal wall or to the neighbouring viscera. The density and extent of these adhesions were practically proportionate to the duration of ulcer, and especially to the severity of the pain.

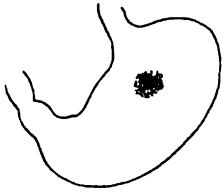
The following diagrams are intended to illustrate the progressive character of the zone of induration in gastric ulcer. The shaded area represents the induration which could be felt and seen at the time of operation. The first 9 were operated on for perforation; of these 5 recovered.



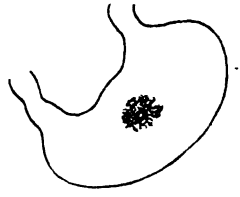
1. Symptoms for 1–2 years.



2. Symptoms for 2–3 years.



3. Symptoms for 4 years.



4. Symptoms for 4–5 years.

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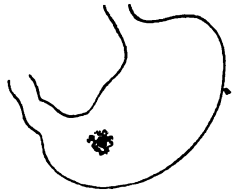
5. Symptoms for 4–5 years.

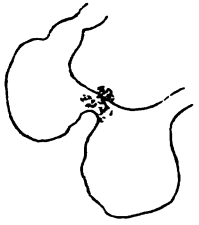
6. Symptoms for 4 years.

7. Symptoms for several years.



8. Symptoms for 7–8 years.

9. Symptoms for 8 years.



10. Stomach of Miss H., aged twenty-one. Symptoms for 14 years; complete relief followed gastro-gastrostomy.

11. Stomach of P.H., aged thirty-four. Symptoms for 15 years.

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In other words, the experience gained in these 11 cases clearly indicates that a gastric ulcer which does not yield to the care of a judicious physician does not remain stationary, but tends surely and steadily to increase in size and to become complicated by adhesions and other conditions, which add greatly to the difficulties of the surgeon when called upon to deal with it.

The truth of this is eloquently testified to by the third operation, to which I am about to call attention, and compels me to urge, and urge very strongly indeed, the desirability of early exploratory operation when a reasonable trial of rest, diet, and drugs has failed to give permanent relief.

Where over 50 per cent. of recoveries can be looked for when operation is carried out under the overwhelming disadvantages of profound shock and a polluted peritoneum, surely with reasonable surgical skill the mortality from early operative interference should be very slight—Mayo Robson puts it at less than 5 per cent. all round.

Here let me say, I do not wish to be misunderstood, *I do not look lightly on an exploratory laparotomy.* It is, beyond question, a very serious proceeding, involving, perhaps, a very trifling danger in itself, but often a very grave one, in its development. No surgeon can say beforehand where he will end when he has once opened the abdomen, or how serious may be the operation required for the relief of symptoms which in themselves may have been comparatively free from immediate danger; but having said this much, I still feel that it is our duty to take this responsibility more freely than we have done up to the present, and to show to physicians and to the public that we are now in a position to give decided and complete relief in numerous cases otherwise hopeless or likely to produce chronic invalids.

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Before calling your attention to the actual operations I have undertaken for the relief of symptoms suggestive of gastric ulcer, I may be permitted to throw out for discussion a suggestion which has forced itself more and more prominently on my mind as one case after another has come under my observation. As is well known, it is the custom with most surgeons who operate for perforation simply to infold the ulcer, the line of suture going well beyond the ulcerated area. No attempt is made to excise the diseased patch. Most of these cases after recovery enjoy the advantage of healthy stomachs, and can eat ordinary diet with perfect comfort. What then has become of the indurated tissue? I believe it undergoes rapid absorption or is actually digested. In support of this view I may refer to the *post-mortem* record of a case under the care of one of my colleagues, whom I had the opportunity of assisting at the operation. A zone of dense indurated tissue bound down by adhesions was infolded with the greatest difficulty. The patient died ten days later from intestinal obstruction. At the autopsy the sutures were found in position, the stomach was absolutely watertight, the induration had completely disappeared. On opening the organ the mucous membrane over the site of the old ulcer was quite normal, and not the slightest indication of its presence could be observed. Opportunities of forming a trustworthy estimate of the results of operation at such a period are very rare, and this must be my excuse for again referring to this case, which I have already published in full.

Reasoning from this and other cases I would suggest that in the majority of instances operated on in the absence of perforation, in which an indurated and adherent zone on the anterior surface could be detected, it would be sufficient to separate the adhesions, if that

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were possible, and infold the diseased area, without any attempt at excision, or indeed, in many cases, without opening the stomach at all. Such a proceeding would reduce the risks to a minimum, and should, I think, give the necessary relief.

I have up to the present had no opportunity of actually testing the value of this method; the suggestion must, therefore, be taken for what it is worth.

I will now very briefly put forward the record of a series of 8 operations undertaken by me for chronic ailments of the stomach.

HISTORY OF OLD-STANDING GASTRIC SYMPTOMS SUGGESTING ULCER—EXPLORATORY OPERATION—HEALTHY STOMACH.

CASE I.—L. S., a young girl, aged twenty-one, had a history of stomach symptoms for years. She was admitted to hospital under Professor Cuming's care, in June, 1899, when she complained of pain coming on immediately after food, nausea, and vomiting. The case was regarded as one of gastric ulcer. She was discharged after six weeks of careful dietetic treatment, but improvement was only slight.

Shortly after returning home she was, she said, as bad as ever, and then developed hæmatemesis. She tried various physicians and many remedies without benefit. She again came to hospital under care of Dr. William Calwell, on February 14th, 1900. Her symptoms were as follow:—

Pain sometimes immediately, sometimes at a varying interval, after food. She vomited frequently, but there was no hæmatemesis while in hospital. She complained of pain and nausea after food of all kinds, and of slight epigastric tenderness. Peptonised milk only made her feel worse, and she vomited immediately after taking it. She was put on nutrient enemata without benefit.

Dr. Calwell asked me to see her with a view to operation. She at once assented. Accordingly, on March 19th, 1900, assisted by Professor Sinclair, I opened the abdomen through the left rectus.

We found an apparently healthy stomach. There was not a trace of induration or congestion on any part of its peritoneal surface. The organ could be freely pulled out into the wound, there being not the slightest adhesion anywhere. The duodenum

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was healthy. We regarded the case as one of hysteria, and decided not to open the stomach. The abdomen was accordingly closed, and the patient returned to bed. She was fed by the mouth from the first, and a week after operation she could eat fish, chicken, and chop with perfect comfort. An injudicious remark during a clinical lecture about two weeks after operation caused a slight relapse, but this disappeared when she was convinced she had not heard aright. In July, four months after operation, she reported herself as slightly sick occasionally, but stated that she had derived great benefit from the surgical treatment. About three months ago she came to me complaining of pain in the left kidney and frequent micturition. The urine was normal, and I declined to interfere.

HOUR-GLASS STOMACH—GASTRO-GASTROSTOMY—RECOVERY.

Case II.—A young lady, Miss H., aged twenty-nine, had been suffering from symptoms of gastric ulcer for fourteen years. She had had several attacks of hæmatemesis. In spite of treatment she steadily got worse, the pain became almost continuous, the vomiting occurred promptly after all kinds of food, she lost weight steadily, and finally was reduced to the condition of a chronic invalid. In November, 1900, she put herself under the care of Drs. Calwell and Fullerton, who recommended an exploratory incision. She willingly consented, and was removed to a private hospital. No attempt was made to inflate or wash out her stomach, as she had had a sharp attack of hæmatemesis on November 1st—four weeks before operation.

On November 27th, assisted by Dr. Fullerton, I opened the abdomen by a median incision from the xiphoid to the umbilicus. Four long thin bands, evidently the result of old adhesions, stretched from the anterior abdominal wall to the upper border of the stomach. When these had been divided the stomach was without difficulty drawn into the wound. An hour-glass stomach of the type represented in the diagram was at once seen.

The constricted portion connecting the two pouches being formed of dense cicatricial tissue, evidently the result of contraction following an old ulcer, it was at once decided to form an anastomosis between the two pouches, and the operation illustrated in the diagram, Wölfler's gastro-gastrostomy, was carried out.

An incision about 2½ inches long was made in each pouch, and the edges united by a double row of continuous silk sutures. So

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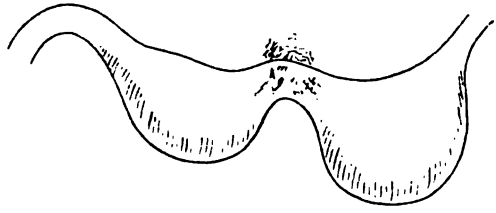
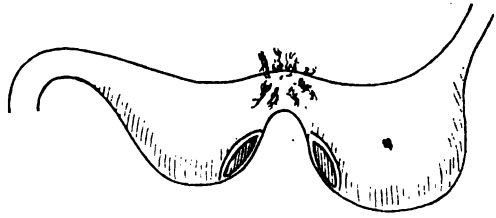
tight was the constriction that my index finger, introduced into the stomach through the incision in its wall, could not be passed through the narrow opening. No attempt was made to interfere with the diseased area. The operation lasted one hour. Recovery was uneventful.

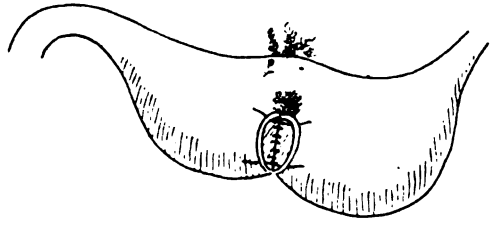
CASE II.—HOUR-GLASS STOMACH.



Case of M. H., aged twenty-nine.—Duration of symptoms, 14 years.



Wölfler's method of gastro-gastrostomy, showing position of anastomotic openings.



Showing application of sutures. The operation gave complete relief to all symptoms.

She was fed by the mouth from the third day. In two weeks she could eat fish, chicken, and chop without any inconvenience. She returned home three weeks after operation. Two months later she called to see me, and I scarcely knew her, so marked was the improvement. She said she never remembered feeling so well. She had just eaten a dinner of roast beef, turnips, and potatoes, without discomfort of any kind.

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ULCER FOR FIFTEEN YEARS—HOUR-GLASS STOMACH—EXTENSIVE ADHESIONS—DEATH FROM SHOCK.

Case III.—M. P., aged thirty-four, a domestic servant, had suffered from symptoms of gastric ulcer for about fifteen years. She had been several times in hospital, and had repeated attacks of hæmatemesis.

Early in February last she suffered from very severe pain, which had persisted ever since. Vomiting became almost constant, and the vomited matter contained coffee ground substance. She was seen by Professor Whitla and Dr. Logan, who sent her into my ward for operation.

She was admitted on March 30, 1901. She was very weak and wasted, with subnormal temperature and feeble and irregular pulse. Vomiting was almost constant, and she fainted the day following admission; she was put on nutrient enemata, and her condition improved slightly.

On examination an intensely tender area was made out below th seventh and eighth costal cartilages on the left side, and this ar was distinctly dull. April 4th, abdomen was opened by an incision through the middle of the left rectus directly over the dull area. This incision at once exposed an indurated zone surrounded by extensive adhesions to liver and anterior abdominal wall. The ulceration extended into the left lobe of the liver, and separation was only effected with great difficulty. The stomach was then found to be firmly adherent posteriorly, and to be hour-glass in shape. The ulcer was infolded as quickly as possible, and the pouches of the stomach joined together by Wölfler's method, as already shown.

The operation, which occupied one hour, was very badly borne; she died of shock two hours afterwards. Unfortunately no *post-mortem* could be obtained. This was certainly the worst case I have ever seen, and a terrible example of the effects of neglected ulcer.

ENORMOUSLY DILATED STOMACH—GASTRO-JEJUNOSTOMY—DEATH FROM ETHER PNEUMONIA.

Case IV.—W. J., engineer's helper, aged fifty-three, had always enjoyed good health up till two years ago, when he suddenly vomited two or three mouthfuls of dark blood. He had since then complained of constant weakness and occasional attacks of vomiting,

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but no actual pain. For the past six months, however, he had persistent severe pain in his stomach, which was greatly increased a short time after taking food. He vomited at irregular intervals, and on a few occasions the vomit contained a small quantity of blood. He was admitted to hospital under the care of Dr. Calwell on March 23rd, 1901.

On examination the stomach was found to be enormously dilated. When distended with gas it reached half way between the umbilicus and pubes; and when a pint of water had been druak, the patient being in the erect position, dulness extended almost to the pelvic brim. A test breakfast showed very feeble digestive power. Free hydrochloric acid was present in considerable quantity in the gastric contents. The case was regarded as one of pyloric stenosis, due to cicatricial contraction. He consented to operation. On April 18th ether was administered and the abdomen opened. The stomach was found to be greatly dilated, but freely movable, except at the pylorus, where it was tightly bound down by adhesions.

Hacker's posterior gastro-enterostomy was performed. A vertical slit being made in the transverse meso-colon, the stomach was pushed through it and junction effected with the commencement of the jejunum by double row of continuous sutures. A number of sutures were employed to fix the opening in the meso-colon to the stomach, so as to prevent the jejunum being dragged into the opening, with intestinal obstruction as a consequence. And I may here say that the points of chief importance for these sutures are at the extreme end of the line of junction. The operation lasted fifty minutes. The patient bore the operation well, and there was little or no shock. Unfortunately, he developed ether pneumonia within twelve hours, from which he died on the fourth day.

At the *post-mortem* the gastro-jejunal junction was found quite firm; there was satisfactory adhesive inflammation without the slightest trace of leakage or of peritonitis. The lungs were both intensely congested with patches of broncho-pneumonia here and there. On opening the stomach, which was about three or four times the normal size, a large ulcer about the size of a crown piece was found on the posterior surface close to the pylorus. It had perforated all the coats of the organ, and its floor was formed by the pancreas. The pylorus freely admitted the index finger, but this was after the viscus had been removed and adhesions separated.

The death of this patient was particularly unfortunate. The

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post-mortem evidence, I think, fully justified the surgical procedure which had been undertaken. About three months before operating on this patient we had a very similar case. He stoutly refused operation. Early one morning whilst still in hospital, perforation occurred, and he died in about two hours. *Post-mortem* revealed pyloric stenosis, with perforation on anterior surface just above the pylorus.

CARCINOMA OF ANTERIOR WALL OF STOMACH—EXPLORATORY LAPAROTOMY—RECOVERY.

Case V.—E. L., female, aged forty-seven, was seen by me in consultation with Dr. Gorman, of Bangor, early in October, 1900. She stated that she had been ailing for two or three months, during which she had suffered from slight nausea and occasional vomiting, with loss of appetite and slight loss of weight. On October 1st, 1900, she had a sudden attack of severe epigastric pain, followed by vomiting. Dr. Gorman then saw her and recognised an abdominal tumour. This tumour was situated above the umbilicus, was hard, nodular, and appeared on palpation to be about 1 in. to 1½ ins. in diameter. It was not at all tender on manipulation, and was very freely movable; in fact, it could be pushed over to the left beneath the costal cartilages.

On inflation with air the stomach appeared normal in size, and the tumour was displaced slightly to the right. There was no excess of free HCl. We recommended exploration, as we regarded the case as one of carcinoma of the anterior wall of the stomach, and thought it might be possible to remove it, owing to the free mobility and absence of any signs of secondary deposit in the liver.

She went into hospital, and on October 29th I opened the abdomen in the middle line directly over the tumour. I was surprised to find a tumour fully three inches in diameter involving the middle third of the anterior wall of the stomach, several well-marked secondary nodules in the liver, and numerous deposits in the lympathic glands, all this notwithstanding the fact that the patient looked remarkably well and had lost very little weight. As there was no indication for gastro-enterostomy, the abdomen was closed, and she returned home two weeks later. The disease rapidly progressed, and she died early in January, 1901.

PYLORIC CARCINOMA—GASTRO-JEJUNOSTOMY—RECOVERY.

Case VI.—A. L., female, aged thirty-eight. First complained of her stomach in August, 1900, when she suffered from slight pain

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and vomiting, which persisted ever since. In October, two months later, she noticed a lump in the epigastric region, and began to lose flesh. She was admitted to hospital on February 9th, 1901, six months after her first symptom. She was then suffering from constant severe pain in the stomach, aggravated by food. She vomited frequently, and in the vomit were coffee grounds. There was a distinct hard nodular tumour a little to the right of the umbilicus. The tumour was fairly movable, and appeared to be about 1½ ins. in diameter; stomach was slightly dilated. The abdomen was opened on February 21st, 1901. A tumour about the size of a crown piece occupied the pyloric region, but was fixed posteriorly by adhesions in the region of the portal vessels. No secondary deposits could be seen or felt, but the adhesions to the vessels were so intimate that successful removal seemed impossible. Posterior gastro-enterostomy was performed, the junction being secured by double row of continuous sutures. The operation occupied forty-five minutes.

Recovery was uneventful, and was followed by complete relief of pain and vomiting. One week after operation she could eat solid food with perfect comfort. She went to the convalescent home three weeks after operation, feeling quite well.

PRIMARY TUBERCULAR ULCER OF CÆCUM—CÆCECTOMY—RECOVERY.

Case VII.—Mrs. R., aged forty-seven, always enjoyed good health till three years ago, when she first began to suffer from pain and tenderness in the epigastrium. Then she complained of flatulent distension, and soon diarrhœa set in, which was worse in the morning, when she generally had three or four motions. These were sour smelling, and contained undigested food and curdled milk. The condition persisted in spite of treatment for a year. She then had an attack of typhoid, during which, curiously enough, the diarrhœa ceased. During convalescence it again returned and had since persisted, though milder in degree. She always referred her symptoms to her stomach, and was in two hospitals and subjected to most rigorous dietetic treatment, but without benefit.

On March 4th, 1901, she was admitted to the Royal Victoria Hospital under the care of my colleague, Dr. Calwell. Her condition then was—some general wasting, slight icteric tinge, complains of epigastric pain and tenderness, slight nausea, three to four loose motions daily. On examination abdomen slightly distended,

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distinct tenderness below the xiphoid, the right iliac fossa bore vigorous manipulation without discomfort.

On inflation with air the stomach appeared to be greatly distended and reached downwards midway between umbilicus and pubes. Distension of the colon indicated that it lay across the pelvic brim. As she was slowly but surely losing ground an exploratory operation was recommended, and to this she at once consented.

On March 24th I opened the abdomen by an incision through the left rectus, commenced two inches above the umbilicus, so as to admit of easy extension downwards to give access to the colon, if necessary. The stomach was found apparently healthy, and about normal in size. A band of adhesion about three-quarters of an inch broad united it to the diaphragm on the left side; this was divided, but was not regarded as sufficient cause for the symptoms. The incision was prolonged downwards and the colon drawn into the wound; it also appeared quite healthy. A number of enlarged glands were then seen between the layers of the mesentery, occupying an area about two inches broad. On being followed this tract led to the ileo-cæcal valve. The cæcum and vermiform appendix were without difficulty drawn into the wound, but nothing abnormal could be seen.

It was decided to open the cæcum opposite the enlarged glands. This having been done, the ileo-cæcal valve was everted through the opening, when a well-marked ulcer, about the size of a crown piece, was seen surrounding the valvular orifice. About one inch of ileum, the cæcum with the vermiform appendix, and a portion of ascending colon were removed. The ileum was united to the ascending colon by an end to side anastomosis, the incision in th colon being transverse to its long axis. Junction was secured by continuous suture without artificial support. The lower end of the colon was infolded and closed by suture. The edges of the divided mesentery having been sutured together to prevent the risk of internal hernia, the parts were sponged with warm saline solution and the abdomen closed. The operation occupied one hour and thirty minutes. Shock was severe, but the patient rallied quickly and subsequent recovery was uneventful. The bowels acted voluntarily on the fourth day. She was allowed up seventeen days after operation, and was free from pain and diarrhœa. She left hospital shortly afterwards. Pathological investigation showed the lesion to be tuberculous.

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SYMPTOMS FOR EIGHT YEARS' EXTENSIVE ADHESIONS—CASEATING GLANDS—GASTROTOMY—RECOVERY.

CASE VIII.—H. H., aged twenty-two, had suffered for eight years from persistent gastric pain and vomiting, and had repeatedly been in hospital. On May 2nd, 1901, I opened the abdomen, and found several adhesions on anterior surface of the stomach which were divided. The stomach was adherent posteriorly, and could not be freely drawn into the wound, but the pylorus and duodenum could be easily seen and examined. Nothing abnormal could be detected in them. Numerous large, firm glands could be felt and seen between the folds of peritoneum leading from the stomach. One of these, the size of a large nut, was removed and examined. It was evidently tuberculous. Next the stomach was opened for about two inches, and the interior examined as well as possible, but nothing could be seen or felt. This examination was very unsatisfactory owing to the posterior adhesions. The stomach wound was closed by double row of continuous sutures, and nothing further done, though the glands had evidently been infected from a mucous surface, the peritoneum being quite healthy. Recovery has been uneventful, and she is completely free from pain and vomiting, and expresses herself as being delighted. It is, of course, too soon to express an opinion as to the ultimate results, but the case adds one more to the list of gastrotomies carried out without danger.

17th June, 1901.—This patient is now apparently quite well, and complains of no discomfort whatever.

I had yesterday morning the opportunity of being present when my colleague, Prof. Sinclair, operated for gastric pain and vomiting of six years' duration. He found an indurated cicatrix on the anterior wall close to the lessor curvature and partial hour-glass stomach. About two months ago my colleague, Mr. T. S. Kirk, on opening the abdomen, found a large ulcer adherent to the anterior abdominal wall, which was excised with signal success.

This series of cases is, I know, a very limited one, and it would not be a wise thing to draw any very decided inferences from the success or failure which has followed

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on surgical zeal. I am inclined, however, to emphasise the following points:—

1. Surgeons have not yet devoted sufficient attention to ulcer of the stomach. Ulcer is, I think, more commonly anterior than is generally acknowledged.

2. Those ulcers which do not resolve under medical treatment give rise to grave lesions in direct proportion to their duration, including pyloric obstruction, hour-glass contraction, involvement of neighbouring organs, and attacks of peritonitis resulting in troublesome adhesions.

3. There is no more serious surgical complication than extensive adhesions, owing to their tendency to involve large vessels, nerve-plexuses, and vital organs. This was well demonstrated in my fourth case, in which the stomach was widely adherent both anteriorly and posteriorly.

4. Where there are extensive adhesions it is probably better to leave them alone and provide for rapid emptying of the stomach by gastro-enterostomy.

5. Where the ulcer is on the anterior wall it may be possible to infold or excise it, which is the ideal method of treatment; but when posterior, this will generally be omitted in favour of gastro-enterostomy.

6. I have no hesitation in expressing a decided opinion in favour of posterior gastro-enterostomy. It is quite as easy to perform as the anterior operation, sacrifices less of the jejunum, and establishes the new opening at the most favourable point for stomach drainage.

7. I prefer the simple and continuous suture for this, and similar operations, without any artificial support. I never open the abdomen without a Murphy's button at hand, but I have only once employed it.

8. In patients over middle life early exploration must

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be more frequently undertaken if the gastric surgery of this period is to attain the triumphs to which it is entitled.

I am aware that I have omitted any reference to many important questions. Indeed, I have only touched the fringe of a vast subject, but I trust I have afforded scope for free discussion, and hope to derive much valuable information from the ripe experience and unhesitating criticism of the famous Dublin School of Surgery.

Mr. T. Myles said that at present there seemed to be a conflict between the drug treatment of gastric ulcer and the surgical treatment. A great many physicians seemed to be content if the symptoms associated with gastric ulcer were relieved. He remembered a young physician saying lately that he did not believe that the condition was in any way improved, except temporarily, by palliative treatment. Referring to the first case, in a girl aged eighteen, they were told that this condition was merely hysterical; but to say a patient was suffering from a hysterical affection of the stomach was, in his opinion, to say she was suffering from something of which the surgeon was ignorant. When a patient complaining of gastric symptoms was found to have a healthy stomach, the first idea that would suggest itself to him would be floating kidney. It was not always easy to detect a mobile kidney, and they all occasionally ignored this possible explanation of those symptoms. He had not much confidence in percussion and auscultation as methods of diagnosis in such cases. It seemed, not that percussion was a defective test, but that they were not able to apply the test reliably. With regard to the death from ether pneumonia, he thought many such deaths were really due to rapid septic poisoning, though he acknowledged that ether pneumonia might occur. Such deaths would, long ago, have been ascribed to secondary shock, but he ascribed them to fulminating sepsis, the source of the sepsis being the surface of the unhealthy stomach itself.

Mr. Lentaigne said he took it that in one of the cases Mr. Mitchell had opened the abdomen under cocaïn, and he would like to know if he had frequently done so, also some particulars as to the

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quantity of cocaîn used, &c. One of the most important questions in these operations was that of time. They would hear a good deal later about the different forms of suture and buttons, more especially Murphy's. He had been for a long time an ardent believer in the suture alone. He disliked leaving a foreign body, like Murphy's button, behind, and he therefore believed in suture, if suture could only be got to accomplish the work quick enough. It would be highly advantageous if they all timed their operations.

Mr. Jameson Johnson said he agreed with Mr. Mitchell's preference for the posterior operation, and also in the importance of the sutures through the meso-colon. Sutures at the end of the incision and additional sutures further out were important in preventing kinking of the bowel and consequent regurgitation of bile. He inquired if in Mr. Mitchell's operations there was regurgitation of bile, because he was trying to make up his mind as to whether cutting across the jejunum, &c., was not the better procedure. At present he believed that posterior gastro-enterostomy was quite sufficient, and that the second operation was unnecessary. His experience was limited to the absorbable bobbins, as he did not employ simple suture or Murphy's button, for the simple reasons that bobbins did not take as long as suture, and furthermore, the patient having been suffering from gastric disturbance for some time, it was important that rigid support should be given for the first few days after operation. They had all heard the objections to Murphy's button, and though the introduction of an absorbable bobbin took a few seconds longer than Murphy's button, he considered that the extra time was not badly wasted. The first case resembled one he had of a man suffering from gastric pain, vomiting, and obscure symptoms indicating either ulcer or obstruction in the stomach. Dr. Parsons saw him, and they both believed him to be a hypochondriac. As the man begged for operation he operated, but could find nothing the matter, the intestines, both kidneys, and all other organs being healthy. He sutured him up, and he left the hospital greatly improved.

Mr. Taylor said that the method of suturing which Mr. Mitchell had adopted was, in his opinion, the best, because in this method they could make a large opening, and one that would not contract afterwards. He did not approve absorbable bobbins, as the opening was small and often shrank to a great extent.

Dr. Travers Smith said that, as a physician, he would like to ask what they proposed to do in such a case as this. The patient,

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a girl, has complained of gastric symptoms for three or four months only, but they are definite enough to lead to the diagnosis of gastric ulcer of recent formation. Would it then be advisable to recommend an exploratory operation, and what would the surgeon, on opening the abdomen, be likely to find? What would guide him to the position of the ulcer, and what would he do with the ulcer when found? The course was quite obvious when there was severe obstruction, dilatation of the stomach, and a distinct tumour due to inflammatory exudation; but, short of these indications, he would like to hear something more definite as to when laparatomy should be recommended. Apart from cases obviously suited for surgical interference, medical treatment gave fair hope of cure. He had seen a number of cases where cure, to all intents and purposes, was complete, and he had observed these cases as long as most surgical cases were observed; so that he asserted that, in recent cases, medical treatment was not to be scorned.

Dr. Greer (Newport) said he wanted to raise the question of the treatment of hæmatemesis. He had recently three cases of gastro-jejunostomy for hæmatemesis, as, owing to the extreme condition of exhaustion and profound prostration, he was unable to do anything else. He used a Murphy's button in each case, and the results were as good as possible. The first was ten months ago, and there had never been an attack of hæmatemesis since. The button was passed about the 16th to the 18th day after. The question of excision of the ulcer had been raised, and he would like the opinion of the Academy on that point. He thought that a gastro-jejunostomy would probably obviate this excision, and that the former, with a button or otherwise, would be associated with less risk. Adhesions, however, would have to be considered also. Recently he had the misfortune to have to perform an autopsy on a case of gastro-jejunostomy with a two-inch Murphy's button. The button did not pass, and a radiograph showed it in the cæcum. An operation was performed by an eminent London surgeon, the button removed, but the wound did not heal. At the autopsy he found the whole abdominal cavity converted into fibrous tissue, and the intestines and all organs simply as if in plaster. This he did not quote as a result of Murphy's button, but rather the primary cause of its failure.

Mr. Lane Joynt said that Dr. Travers Smith had raised the question as to the treatment by operation of the ordinary cases that every physician or surgeon saw dozens of in the hospital dis-

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pensaries. His experience was that they were not suitable cases for operation. Nearly all of them were anæmic, hard-worked, and under-fed. No man, however, would hesitate in a case of violent hæmatemesis, for there it was a case of urgency.

Dr. Parsons, referring to Mr. Taylor's observation as to the liability of contraction after the use of a bobbin, said that in three of the cases he had seen the bobbin had been used. Two of them were cases of malignant disease, and in one life was prolonged for three months, and in the other for eighteen months. They found that in the latter a sufficiently large opening had remained. When that was so, notwithstanding the lapse of eighteen months, it seemed that Mr. Taylor's objection could be got over by using a sufficiently large bobbin. Even if the diagnosis were correct, as Mr. Mitchell had confessed, an internal examination was conducted with great difficulty. What were they to do in very early cases? Were they to open the stomach from end to end, and search for the ulcer? Even *post-mortem* there were cases where they were absolutely unable to find where hæmatemesis, occurring before death, had come from. To recommend an operation merely because a patient had got pain was, speaking generally, not justifiable. He felt that the surgical treatment was extremely brilliant, yet he also felt that Dr. Calwell deserved at least equal, if not greater, praise for realising cases past medicinal treatment.

Mr. Lentaigne inquired of Mr. Mitchell if he had met with cases of hyperchloridia, and if the question of operation would then arise. With reference to the time for surgical interference, there was a great difficulty even to the surgeon in that matter. He was called to see a gentleman two years ago who was suffering from ulcer which had gone so far that he had tremendous hæmorrhage, covering the floor with thick clotted blood. Here was a man suffering for five years from symptoms of gastric ulcer. Operation was absolutely refused. He was treated medicinally, and it was only fair to say that that man got well, and was perfectly well now, and has had no recurrence whatsoever. He was treated with grain doses of carbolic acid every fourth hour, and no other treatment except dietetic. That was an interesting case, in view of Dr. Greer's references to the question of hæmatemesis. Dr. Greer had treated his cases by gastro-enterostomy, which he knew had been recommended abroad for hæmatemesis, but he was not aware previously of its being practised in this country. He had read of Mickulicz's operation for that condition, where he opened the

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stomach, scraped an ulcer, and got a patient to recover without recurrence of the hæmatemesis.

Mr. M'Ardle said that they, as surgeons, did not advocate interference with stomachs indiscriminately, but when there was evidence of symptoms not influenced permanently by medication, it was only just that such cases should have the benefit of surgical interference. With regard to opening the abdomen during life and examining it after death, the difference was exactly the same as the difference between day and night. In the day they saw everything, in the night—well, they knew. In the day of life, on examining the stomach, they did not see empty vessels, but they saw, leading to the place of disease, that there was an infallible guide, and that was the condition of the veins of the stomach. Because of this indication he could not understand why there should be any removable disease that could not be found out. On the posterior wall there might be some difficulty, but with the modern gastroscope where was the impossibility? They opened the stomach, not from end to end, but for two inches, looked in, and with the gastroscope they saw (in life they could see what was impossible after death) the vascular fringe surrounding these ulcers, and this was never absent. Fully ten years ago, after he (Mr. M'Ardle) had read some papers on pyloric resection, Spanton, of Newcastle, sent him a case in which there had been persistent stomach trouble for five or six years. The simplicity of the case when a laparotomy was performed made them wonder how they were so ignorant. He found, what he had often discovered since, that all the gastric symptoms were the result, not of gastric trouble itself, but of a tag or band crossing the pylorus from the transverse colon, and fixed to the border of the gall-bladder. In contrasting Murphy's button with sutures and bobbins there was some confusion, as they contrasted cases of operation when the patient was half moribund with cases in which the abdomen was perfectly healthy. Moreover, a man who has had no experience of Murphy's button should not condemn it. There were also many things to be looked to in the application of the button which, if neglected, would lead to deceptive results. He begged to take exception to the statement as to the hesitancy of the physicians of the metropolis in the matter of surgical aid as compared with their brethren of the northern capital. The physicians with whom he had come in contact had given him ample opportunities, and their diagnosis was always reliable. With reference to adhesions of the

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stomach, particularly near the pyloric end, they were always attended with intermittent pain—pain which, in his experience, only came on, not after food, but after exercise.

Mr. Mitchell, replying, said that Dr. Smith had put a case before him, and asked him what he would do under those circumstances. In that case he would let the patient alone. He would leave her to Dr. Smith. They came in when the physician said he could do no more. It was unquestionable that a large percentage got better medicinally, but, on the other hand, a larger percentage than was generally recognised died from inefficient treatment. With regard to ether pneumonia, he did not think his case was one of septic poisoning, because of the enormous quantity of mucus poured out after the ether. It was, strictly speaking, a broncho-pneumonia. In reply to Mr. Lentaigne, he had used cocain five times. First in a case of acute intestinal obstruction, in which general anæsthesia was out of the question. He used a ½ per cent. solution, with two of resorcin, and a half or one of morphin. He had twice performed inguinal colotomy under cocain without the least pain. With regard to the question of bobbins, they could not use a large one when working at the jejunum or stomach, but had to limit themselves to one likely to pass through the ileo-cæcal valve. He wished it to be understood that he did not condemn Murphy's button. In operating, so much time was not occupied in the actual operation as in consultation and deciding what course to follow.

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SECTION OF OBSTETRICS.

NOTES ON A CASE OF SUCCESSFUL APPLICATION OF THE FORCEPS WHERE CÆSAREAN SECTION HAD BEEN PREVIOUSLY PERFORMED.

By F. W. KIDD, M.D.;
Consulting Surgeon to the Coombe Hospital.

[Read in the Section of Obstetrics, December 21, 1900.]

I MUST apologise for bringing forward such a short communication, but my only excuse is that, having made an exhaustive search, I could not succeed in finding any similar case recorded.

CASE.—The patient in question was first admitted into the Coombe Hospital on the 3rd of December, 1898. She was then aged thirty-two years. She had been visited at her own home by a student of the hospital on the same date, who had diagnosed the obstruction.

On admission into hospital, the following condition was observed:—Cervix was soft, especially the anterior portion; os patulous, so as to admit two fingers; was displaced forward, close to pubis; the posterior wall was convex, caused by a hard growth springing from the body of the cervix; this also caused an enlargement posteriorly, extending towards the promontory of the sacrum; it was regular in outline, and palpably a fibroid growth, seemingly about the size of a goose-egg. The head of the child was misplaced on to the ramus of the pubis, and to the left side. Every endeavour was made to try and raise up the tumour, so as to get it above the rim of the pelvis. This, however, was found impossible, owing to the fact that the tumour sprang from the cervix itself. There remained then but two alternatives—either to perform Cæsarean section, or to remove the tumour that blocked the pelvis by enucleation or morcellement. The child seemed strong, fœtal heart being 134 before operation; membranes were unruptured,

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nor was there any formation of a contraction ring, so that the case seemed one favourable for Cæsarean section.

The incision in the abdominal wall extended from three inches above the pubis to two inches above the umbilicus. The placenta was attached beneath the incision "placenta prævia Cæsareana." Immediately the child was delivered, as it seemed semi-asphyxiated, it was handed to Dr. Stevens to Schultz it; he very soon succeeded in getting the child to breathe freely without any assistance. The placenta measured 11 by 7 inches, instead of the normal 7 by 6. The child, a male, weighing between 7¾ and 8 lbs., died on the evening of the third day; it had slight convulsions on the preceding day, had vomited blood, and always had a rigidity of the muscles of the body. An autopsy revealed minute hæmorrhages from the œsophagus and upper portion of the stomach; there was also some changed blood in the stomach cavity itself. Now, it is a query if this blood was the result of the rupture of some small blood vessels, the result of Schultzing? although on this occasion the operation was performed by an assistant of great experience and skill.

The operation was performed by the aid of gas-light, at 2 a.m. in the morning. During convalescence the temperature never went above 99·6°, and only on four occasions did go above 99°. At the time of the operation the tumour was felt filling up to the brim of the pelvis posteriorly. If any attempt had been made to deal with it at the time nothing could have been done but a panhysterectomy; this was deemed inadvisable owing to the weakened condition of the patient, and the lingering hope that the tumour might subsequently be removed through the vagina. At the time of reporting the operation the following remark was made:—"Looking back, I now regret that I had not adopted the precaution of removing the ovaries, or, as has been advocated by Dr. Murdoch Cameron of Glasgow, of tying both the Fallopian tubes." Had such a procedure been adopted, I could not now have brought forward this case. When the patient was convalescent on the first occasion, and before she left the hospital, she was placed under an anæsthetic. I had the advantage of the opinion of Dr. William Smyly as to the advisableness of operative measures for the removal of the tumour. On examining the patient, it was found that, as the uterus had involuted, the tumour had come down with the uterus until it had filled up the hollow of the sacrum. It was evident that as the uterus had increased in size it had drawn

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up the tumour as far as it possibly could. The tumour was now felt so near the examining finger that the simplest method seemed to be to attack from the post *cul-de-sac ;* this, however, Dr. Smyly dissuaded me from attempting, because there evidently was an adhesion of the uterus to the abdominal wall anteriorly, and, in such a case, should any troublesome hæmorrhage occur, it might not be possible to control it efficiently, unless the uterus could be drawn down. If any operation were to be adopted, he would recommend an abdominal section.

The patient left the hospital with the usual warning—to come and report herself from time to time, and should any pain or untoward symptom arise, and especially should she prove pregnant, to come back AT ONCE. This advice she neglected *in toto*, and nothing more was heard of her at the hospital until the 2nd of September, 1900. She then stated that labour had commenced on the 30th of August at 12 noon. She had not sent for any assistance until labour had gone on for a long time. When she was seen by Dr. Sarah Davidson (who was clinical clerk at the time) she was immediately brought into hospital. On examination the membranes were found ruptured, and the patient seemed in the second stage, but the tumour acted as a wedge and prevented the descent of the head. The general condition of the patient was not bad, and the fœtal heart was 128. According to the patient's statement the first and second stages combined had lasted 73 hours and 35 minutes. The posterior wall of the uterus was drawn up as high as it could possibly go; nevertheless the tumour did not seem to afford as great an obstacle as it did on the first occasion, so that I determined to try the forceps, the head being in the left occipito-anterior position. When the patient was prepared the forceps were applied, the patient being under an anæsthetic. With some considerable traction the child was delivered, but in order to try and save it the perinæum was disregarded, with the result that it was somewhat lacerated. A female child, weighing 8½lbs., was safely delivered. Dr. Hughes (Assistant Master) afterwards removed the placenta, which was on the anterior wall of the uterus, and very adherent; in fact, the removal was extremely difficult, but was successful. Two stitches were afterwards put in the perinæum. Her convalescence was uneventful, temperature only once reaching 98·6°, and pulse never above 80. She left hospital on the morning of the tenth day under the promise of returning to see me, but she never has reappeared since. When she went away the fundus was

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on a level with the pubes, and she was nursing her child. I regret that I cannot give any details as to her present condition, but I hope some time in the future, through the courtesy of Dr. Stevens, the present Master of the hospital, that I may have another opportunity of examining the pelvis. The adhesion of the uterus to the abdominal wall must have stretched so as to allow the uterus to accommodate an 8½lb. child. May it not even now be a source of danger to loops of intestine? One question of interest involved is whether the condition of the tumour at the time of the second labour was owing to the fact that it might have involuted along with the uterus after the first confinement, and failed to enlarge again at the subsequent pregnancy. Had this woman's uterus been removed by Porro's operation or by panhysterectomy, or had her ovaries been removed, she could never have participated in the blessings of maternity. No greater testimony to the care used in suturing the uterus after the Cæsarean section could possibly be adduced than the fact that the uterus—the patient was over 73 hours in the first and second stages—stood the strain of labour for so long without any detriment.

Dr. Purefoy said one of the many interesting points raised by that important case was the light it helped to throw on the behaviour of fibroids where the patient became pregnant. No doubt it would depend to a large extent on whether they were pedunculated or interstitial, but even then he had watched them behave in so many different ways as to increase and diminution in size, both during pregnancy and in involution after pregnancy, that it was impossible to form any prognosis as to what their behaviour would be.

Dr. Smith said Dr. Purefoy had touched on a point of the greatest interest. He recollected a pregnant woman who came to him with a large tumour occupying the pelvis. On examining her under ether he could not push the tumour out of the pelvis, and he thought the woman could never deliver herself; but in fact she did deliver herself without any difficulty. He regretted they did not know the present condition of the tumour. Sometimes during delivery these tumours got squashed and then atrophied, and almost disappeared.

Dr. Macan said he thought they should either suppose some great change had taken place or else that in the second labour, for

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some reason, the tumour had been drawn upwards out of the pelvis. If the tumour was connected with the lower uterine segment it would be pulled up with it. He remembered a case in the Rotunda where there was hardly any room for his hand to go through, but as labour went on the whole tumour went up out of the pelvis. It seemed to him possible that the Cæsarean section itself might have had some effect on the tumour. With the tumour still remaining in the pelvis it was difficult to understand how a child weighing 8½ lbs. could have passed unless the tumour had undergone some change in size.

Dr. Kidd, in reply, said—With regard to the possibility of the tumour decreasing in size during pregnancy, they should believe it had increased in size as a natural effect of the increased blood-supply to the organ. Certainly every effort was made in the first instance to replace the tumour before they resolved on Cæsarean section, but they could not move it at all. In the second instance it seemed to him that the tumour had flattened out posteriorly, and that it was higher up, both because the antero-posterior diameter was less and because the woman was 73 hours in labour.

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REMOVAL OF EPITHELIOMA OF CERVIX UTERI DURING PREGNANCY AND VAGINAL HYSTERECTOMY AFTER DELIVERY.

By R. J. KINKEAD, M.D. (Dubl.);

Professor of Obstetrics in the Queen's College, Galway;
Physician and Gynæcologist to the Galway Hospital.

[Read in the Section of Obstetrics, December 21, 1900.]

Mrs. G., aged twenty-eight, multipara, was admitted to the Galway Hospital in March, 1900. She was eight months pregnant. Bleeding from the uterus had commenced a couple of months previously, and having become severe, and the patient being white and weak, Professor Brereton was called in. He detected a tumour on anterior lip of os, and urged her immediate removal to hospital.

The patient was blanched, pulse rapid and weak, respiration hurried, bright red blood was oozing from the vagina, a tumour about the size of a small hen's egg, irregular in outline, and with rough surface, attached to anterior lip by a broad pedicle, was found, which bled freely on being touched. The bleeding being active I proceeded to remove the growth: the tumour was exposed by a Sim's speculum, and grasped with a forceps in order to pass a ligature through the pedicle, it, however, was too friable, and broke down under grip of forceps; I, therefore, removed most of it with my fingers, curetted the remainder off, applied perchloride of iron to stump, and tightly packed the vagina. The packing was removed next day, and the vagina irrigated, there was no more bleeding, and no uterine disturbance, and she was discharged from hospital at end of week.

She was re-admitted on May 9th, having been delivered about a fortnight previously by Professor Brereton.

She was very anæmic, although there had been no hæmorrhage between removal of the mass and delivery, nor from the latter date up to her admission to hospital, nor had there been much blood lost at confinement.

On examination there was no tenderness or fulness anywhere

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over the abdomen, and no enlarged glands, uterus partially involuted, slight offensive lochial discharge, uterus freely movable, vaginal vaults clear and yielding; a mass the size of a duck's egg, rough, bleeding when touched, was seen attached to anterior lip of os and cervix, the posterior lip slightly œdematous.

The vagina was irrigated three times a day with Condy's fluid and water until the 25th, when I removed the cancerous mass, which had increased in size since her admission; the cut surfaces were brought together with silkworm-gut, and the vagina was washed out with Condy and water three times a day.

On the 9th of June, assisted by Professors Lynham and Brereton, and Dr. M'Kelvey, ether being administered by Mr. Waters, House Surgeon, I removed the uterus per vaginam. Although the uterus was still imperfectly involuted there was no special difficulty in its removal. The vessels, however, were large and the tissues soft, and it was a matter of time and difficulty to control the bleeding, especially from the recto-vaginal septum, and I did not proceed to plug the vagina with gauze until I had satisfied myself, both by careful inspection and the application of gauze pads to the cut ligaments and tissues, that all bleeding had ceased. The patient bore the operation well. However, some hours after, during my absence on an urgent case, hæmorrhage set in: Drs. M'Kelvey and Waters removed the vaginal plugs, passed a ligature round the right broad ligament, replugged the vagina, and transfused normal saline under breasts.

I saw her at 6 20 p.m., she was comfortable, and apparently none the worse of the bleeding.

At 9 p.m. I was sent for, as hæmorrhage had again occurred: on arriving at the hospital I found gauze plugs in vagina soaked, and blood oozing from the vulva, and the patient complaining of singing in the ears and air hunger.

On removing plugs and clearing out clots I was able to locate the bleeding—more a general oozing than from any particular vessel—in recto-vaginal septum and right broad ligament: the latter had not only been carefully tied off in sections during the operation, but on secondary hæmorrhage occurring had a ligature thrown round it; this ligature had probably slipped off, for I could not find it. I passed a couple of silkworm-gut sutures at bleeding points of the septum and clamped the broad ligament, this proved successful, there was no recurrence of hæmorrhage. The clamp was removed on the morning of the 12th. She was

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much troubled with flatulence, vomiting, and hiccough, and there was a good deal of pain at intervals in the abdomen.

On 13th, after an enema of 8 oz. warm olive oil, she passed a small motion with much wind, and in the evening the bowels were well moved: her condition was unsatisfactory for several days, stomach irritable, temperature fluctuating, and a sharp attack of diarrhœa.

On the 22nd there was a distinct fulness in right iliac fossa, tender to touch, with pain in the back: on 25th and 26th a large discharge of offensive-smelling pus took place, after which she improved and took nourishment well.

On July 1st I found and removed a strip of gauze, which had evidently been pushed high up into the pelvis.

Her after-progress was uneventful, and she was discharged from hospital, well and strong, on August 16th.

There are some noteworthy points about the case.

The very active hæmorrhage from so small a tumour, and its entire cessation on removal; its removal without the operation and subsequent plugging of the vagina inducing labour; the rapid regrowth of tumour, sufficient to cause difficulty in delivery a month after its removal.

The successful issue, notwithstanding unfavourable circumstances: within two months the patient had to undergo—(1) removal of original tumour; (2) labour with instrumental delivery; (3) removal of regrown mass, in order to disinfect the vagina; (4) vaginal hysterectomy.

She was profoundly anæmic from loss of blood, the tissues of the genital passages were white and their vitality so low that the weight of the handles of the pressure forceps on the broad ligament caused necrosis where they rested at the vaginal orifice, and the use of catheter had to be discontinued on second day from necrotic patches at urethral orifice, although before and after its use the vulva was irrigated, the catheter itself boiled, both before and after introduction, and between times kept in a 1 in 20 carbolic solution.

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Finally, for 22 days a strip of gauze remained above and behind the right broad ligament; it was out of sight when, in order to stop the secondary hæmorrhage, I took out the dressings from the vagina on the night of the 9th; it was not visible when the wound was first dressed on the 16th, nor on any other dressing until the 1st of July.

Had it an injurious effect? and was the formation of pus due to its presence, or to infection of wound during the two attempts to control the secondary hæmorrhage? Or was its presence beneficial, by limiting the extension upwards of pus, and acting as a drain? It is hard to say; but the pus and broken-down clots were discharged on the 26th, the gauze found and removed on the 1st of July; yet from the 26th to the 1st of July the temperature was normal, the patient's condition steadily improving, and she was free from pain.

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FOUR CASES OF LAPAROTOMY.

By R. J. KINKEAD, M.D. (Dubl.);

Professor of Obstetrics in the Queen's College, Galway;
Physician and Gynæcologist to the Galway Hospital.

[Read in the Section of Obstetrics, February 8, 1901.]

On admission to hospital it is difficult, often impossible, to get a reliable history from patients; in some, this arises from defective powers of observation, in others, the mind seems concentrated on the present, and all that has gone before is forgotten, or mixed up with what the neighbours or friends have said: some come in at the last moment, so ill and exhausted that they are unable to tell how long they have been complaining, or how their illness began; while with some, the difficulty is largely one of language, especially in Irish-speaking persons, who have to translate what they say, and what is said to them, from one language to another.

Case I.—In the first case this was very marked; her knowledge of English was limited, and on admission she was in a condition of profound physical and mental prostration. She could not tell her age, nor how nor when she got ill; all the information she could give was that for some months she "had been getting bigger," believed she was pregnant, that four or five days ago pains in her abdomen began, that after three days of "strong labour," the doctor was sent for, that he found something wrong, and advised her to go to hospital at once. On 16th July, 1899, she crossed in a canoe from Arran to Costello Bay, some 20 Irish miles from Galway, and from thence was brought on a cart, and was admitted to the Galway Hospital the same evening.

The abdomen was enormously distended, with large veins ramifying over its surface, and there was a distinct line of

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demarcation—crescentic, with convexity downwards—between transverse colon and the tumour; except over transverse colon and stomach, the abdomen and both flanks absolutely dull on percussion, tense, sense of resistance equal, faint fluctuation, surface smooth, umbilicus not prominent.

Cervix uteri small, bent back, immovable and high up in vagina, Douglas' pouch filled with soft elastic mass.

She suffered from severe pain, and frequent vomiting of dark green offensive fluid and obstinate constipation. Temperature sub-normal, pulse rapid and weak, countenance haggard and anxious—a hypodermic of morphia relieved the pain, checked the vomiting and procured two or three hours' sleep.

Next morning I opened the abdomen and evacuated a very large quantity of dark-coloured viscid fluid, along with which there escaped considerable transparent membrane, streaked with white cords. On passing my hand through the incision, I found the abdomen filled with this membrane, like a huge spider's web; on clearing it out, a large cavity, with perfectly smooth walls, was left. On the left side there was nothing but the parietes between the hand within the abdomen and that without, but on the right side, extending close to the mesial line, the small intestines could be made out flattened by pressure, and firmly bound to the abdominal wall; above, the stomach, liver, &c., were shut off by the sac wall; below, above the pubes, covered by the lining membrane of the sac, fixed firmly to the parietes, was a tumour of the size and shape of a month's pregnant uterus—below and behind it, projecting into the pelvis, was another elastic mass feeling like a thick membranous bag; neither tubes nor ovaries could be made out, and the cavity of the pelvis was filled with old friable blood clots.

The woman was so exhausted by continued pain, loss of rest, vomiting, the long journey by sea and land, and the shock of the operation, that I could not do more than clear out the pelvis and cavity. The wound was closed by interrupted sutures of silkworm-gut, an enema of hot normal saline, beef tea and whisky was administered, and $\frac{1}{30}$ strychnin given hypodermically.

She rallied slowly but satisfactorily. On the 21st her bowels began to move, and she passed an enormous quantity of most offensive fæculent matter, five or six large motions daily, until the 24th.

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The temperature was normal until the 31st. The dressings were not stirred till the 1st August, when I removed the sutures; they were perfectly dry and unstained, and the wound was quite healed.

But there was evidence of fluid in the abdomen, which steadily increased in quantity until the 6th, when the upper angle of the wound first bulged and then gave way under the pressure, discharging foul-smelling purulent fluid.

On the 31st July, 7 days prior to giving way of upper angle of wound, she had a rigor, the temperature rising to 101°, from which date to the 10th August it ranged from 101° to 103·8°, with daily drops of 2° to 3°.

On the 10th I made a counter-opening below lower angle of wound, evacuating a large quantity of exceedingly fœtid pus, passed in a drainage tube, and washed out cavity twice daily with Condy's fluid and water. The temperature fell to normal on the 11th, and the further progress of the case was uneventful. At present the woman is in good health.

There are some interesting points:—

1. The gradual distension, the obstruction of the bowels, and the colicky pains arising therefrom, being mistaken for pregnancy and labour by a woman, the mother of several children.

2. The position and condition of the small intestines—emptied of their contents, flattened by pressure, bound to the abdominal wall—there was nothing to indicate their presence, no difference to the touch, nor in the fluctuation wave, no inequality of surface, and absolute dulness on both sides. That they extended from close to the mesial line towards the right was merely an accident, they might as well have been tied up directly in front or under the mesial line, in which case there would have been danger of wounding them in opening the abdomen, a certainty of so doing if the case had been dealt with by the trocar, as some cases of ascites still are.

3. What produced the purulent discharge? The operation was strictly antiseptic; the wound was not touched,

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or even looked at, for 14 days, and was then found healed, and dressings dry and unsoiled: for 13 days the temperature was normal, the patient well and cheerful, then a rigor and temperature indicating formation of pus.

4. The satisfactory result; the exudation which formed the sac and tied up the intestines and uterus, seems to have liquefied or been got rid of. Since this was written I have heard from the local doctor that he saw the patient, who was quite well.

Case II.—Mrs. F., aged thirty-three, multipara, suffering from menorrhagia, was admitted on 25th April, 1900. Her youngest child seventeen months old; she did not menstruate for thirteen months after its birth, and then only twice slightly. A week after the last period "bleeding began, and has continued ever since." Some time before it began she had pains in the right groin, the pain continued, more severe at times, till a week before she came into hospital, vomited, but not collapsed, when pain began. "Some time back, maybe four or five years ago, was very ill;" began with bad pain in right groin; was very weak and stomach very sick, abdomen generally tender; was in bed for a fortnight or three weeks; has had several attacks of pain and sickness since, lasting a couple of days; "did not think much about it" until she began "to lose her life's blood," and get weak.

She was blanched, pulse rapid and weak, pupils dilated, palpitation, nervous and desponding, abdomen not enlarged. No distinct tumour, but resistance, fulness and tenderness over lower portion, especially towards right iliac fossa. On 26th bleeding recommenced. She was given 15 ♏ doses of Long's solution of ergot every four hours, and vagina plugged; bowels cleared out by an enema. On 27th she was etherised and examined; genitals blanched, uterus enlarged, slightly movable, os patulous, cervical canal congested; a tumour size of an orange in Douglas' pouch, tense, immovable, indistinctly fluctuating.

The uterus was swabbed out with iodised phenol, which stopped the bleeding.

On 6th May hæmorrhage recommenced, and on 7th iodised phenol was again applied.

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From the 25th April (date of admission) to 9th May the temperature was subnormal, and the bowels were moved twice daily, except on April 28th, when there was one, and on the 30th, when there was no motion; this is noteworthy in the light of subsequent evacuations.

On May 9th the temperature ran up, sharp pain set in, with tenderness over abdomen, vomiting and constipation, on 10th she was worse, on 11th the vomiting was persistent, pulse rapid and weak, face pinched, haggard and anxious, abdomen tender, vermicular action of intestines visible, operation imperative. Assisted by my colleague, Professor Brereton, by Dr. M'Kelvey, and Mr. Waters, House Surgeon, who administered ether, I opened the abdomen.

The peritoneum was thickened, and fleshy in appearance, so much so that I was doubtful of having reached it until, on nicking it, dark sanguineous fluid gushed out; on enlarging the opening a quantity of the fluid escaped; the omentum was adherent by its margins to the abdominal wall and to the intestines, it was thickened and shrunk up, presenting the appearance of a flat, fine Turkey sponge: on separating it from the abdominal wall and intestines, the former was found to be covered for its lower third with recent lymph, and the latter to be bound together by both old and new adhesions, to deal with which I had to enlarge the wound to above the umbilicus. All the time the dark sanguineous fluid was welling up, and when sponged out, I found the coils of the small intestine, for almost its entire length, adherent to each other: fortunately I was able to separate them without injuring the bowel. On stripping the sheets of recent lymph off the abdominal wall, the parietal peritoneum presented the curious appearance as if an extra layer had been laid on over lower portion.

The pelvis was cut off from the rest of the abdominal cavity by old adhesions, especially firm and thick towards each iliac fossa; uterus firmly adherent to bladder, the tubes and ovaries, bound together, were lost in the mass.

The tumour in Douglas' pouch was covered by organised lymph, and closely connected to the sigmoid, which was twisted and constricted. I was able to free the sigmoid from the adhesions, and partially to free the right tube and ovary when the patient collapsed, and it was evident she could not survive further efforts to clear the pelvis. The abdominal cavity was

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rapidly sponged out, and well douched with hot normal saline, $\frac{1}{30}$ gr. strychnin, hypodermically, and an enema of hot saline and whisky administered.

The peritoneum was closed by a continuous catgut suture, and the parietes by interrupted silkworm-gut.

The patient was pulseless, and profoundly collapsed when put back to bed: another $\frac{1}{30}$ gr. of strychnin was injected, the foot of bed raised on blocks, hot water jars placed at her feet and about her body, and an enema of beef-tea, brandy, sal volatile and hot normal saline was, by means of a No. 13 red rubber catheter, thrown high up into the rectum. Reaction gradually took place, and she passed a fairly good night; urine scanty and albuminous: troubled with cough and considerable expectoration. The urine continued scanty and albuminous for some days; the bowels were moved once on 13th, and from 2 p.m. on the 15th to morning of 17th she passed 19 large stools, 18 of which were solid. On 16th the centre of wound opened, and there was a copious discharge of fluid, similar to that removed at the operation: it changed to raspberry colour on the 17th, with an offensive smell; became purulent on the 24th; it continued up to the end of May. The fistula was first washed out with peroxide of hydrogen, which did not appear to produce any effect, and then with 1 in 40 carbolic, under which discharge steadily decreased.

On the 21st the pulse fell to 40, became weak and intermitting, and she suffered from breathlessness and palpitation, especially if she lay on left side: on 22nd pulse was still only 40; $\frac{1}{200}$ gr. atropin was injected in the morning and repeated in the evening, and on 23rd pulse was 60, stronger and regular.

At the time of operation the temperature was 101°; next day normal, next day 100°, after which it ranged from 98° to 99° until June 5th, when it fell to normal.

She came in to see me on 21st Sept. last. She had put on flesh, looked and felt well, had a good appetite: menstruation regular and painless, bowels regular, abdomen soft, no tenderness, no fulness, feels healthy. Uterus normal in size and freely movable, tumour in Douglas' pouch gone, vaginal vault normal to touch.

In both these cases, although the eventual results were good the operations were unsatisfactory, for an incomplete operation can never be satisfactory to the surgeon.

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Case III.—M. N., aged eighteen, was admitted to the hospital on 3rd May, 1899, with a history of indifferent health and for a "lump in her side"—a tumour in left groin was plainly visible. On 5th she was examined under ether. The tumour—hard, elastic, slightly movable, oval in shape and smooth—projected above pelvic brim, about size of orange, the remainder of abdomen free from growths; per vaginam the tumour is felt in pelvis, dipping down to left, and towards back, of vagina, extending to within an inch of its orifice. Rectal examination showed lower portion of tumour to be within recto-vaginal septum, increasing in size as it passes upwards; movable to a slight degree, but feels as if attached to ilium; the upper portion can be moved a little laterally, the lateral motion does not affect the lower portion. Subsequent examination showed that there was very little tenderness in the tumour.

The uterus was normal in size and position, and freely movable.

There was no difficulty in urination, the urine was normal in quantity, containing neither albumen nor sugar. Lungs healthy, no cough, heart normal, bowels fairly regular, occasionally needing a dose of aperient medicine, or an enema. The patient was small for her age, thin and pale; she suffered occasionally from sharp pain; the tumour increased in size very slowly, but the constitutional disturbances were marked, anorexia and occasional vomiting with sharp exacerbations of fever.

Her temperature on admission was 100°, from 5th to 9th of May it was normal or subnormal, from the 9th of May to the 21st July it was never under 99°; it frequently went up to 101° and 102°, sometimes to 103° and 104° with morning or evening falls to 99°. As time passed on the rise and fall became more marked and more constant, her condition deteriorated, and it became imperative to operate.

On the 21st July I operated, assisted by Professors Colahan, Brereton, and Lynham. Ether was administered by Dr. M'Kelvey, House Surgeon.

The abdomen was opened in the mesial line, the incision extending from immediately below the umbilicus to within 1½ inches of the pubes. With the exception of a portion of omentum, firmly adherent to the peritoneum at upper angle of wound, the abdominal contents appeared to be healthy.

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The upper portion of the tumour covered by the peritoneum was now plainly visible. The abdominal walls were rigid and unyielding, which, together with the small size of the patient, rendered it impossible to deal with the tumour through the central opening alone. I therefore made a transverse incision from the centre of the middle one to above the iliac crest, the epigastric artery was caught and bleeding controlled by pressure forceps.

The peritoneum covering the tumour being cut through, with some difficulty I enucleated a smooth oval tumour the size of a turkey's egg. It was then found there were two others—one small, about the size of a walnut, easily removed; the other twice the size of the first, with a tail about the size of, and having the appearance of, a lamb's sweet-bread, which extended down between rectum and vagina, towards the left side, to within less than an inch of their orifices: the attachments of this tumour were dense and very firm, and the enucleation was exceedingly difficult, by working behind it and enucleating from below upwards I was able to get it out entire. There was very little hæmorrhage. The cavity having been sponged dry, the sac was closed by a continuous silk suture, the abdominal cavity was washed out with hot normal saline, the transverse incision was first closed, the peritoneum by a continuous silk suture and the rest of the abdominal wall by interrupted silk-worm-gut, passing through skin, muscles, and fascia, care being taken to accurately approximate the cut ends of the muscles.

The operation lasted exactly two hours, and was well borne. Although she slept well, the patient was very excited and restless for two days after the operation, constantly tossing about and wanting to get out of bed; the bowels moved the second and third days, and the temperature was normal till the early morning of the 26th, when it rose to 100°. The wound was dressed in the forenoon on that day, and found looking healthy; union had taken place, dressings quite dry. Dressed again on 29th, when second suture from outer end of tranverse incision was removed; on 30th stitch abscess formed and evacuated. From this date up to 26th December, when she died, there was endless trouble from abscesses.

As great care was taken to cleanse the skin of the abdomen, and to keep the operation thoroughly aseptic, I think the infection of the stitch wounds must be attributed to the fact

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that during her tossing about and efforts to get out of bed she for a short time displaced the dressings and exposed part of the transverse incision, and I am inclined to attribute the persistence of the suppuration and the formation of deep sinuses to the silk sutures having become infected, and conveyed the infection along their course. Finally, the kidneys became amyloid, the urine albuminous, anasarca appeared, and the patient died five months after the operation.

Case IV.—S. H., aged twelve, admitted 3rd June, 1899, for ascites. Her family history was bad: her mother and one or more sisters had "died of consumption."

During the time she was in the hospital one brother was admitted with pleuritic effusion, and another suffering from pulmonary tuberculosis.

There were sub-clavicular dulness, crepitus and rhonchi over left side of chest to the back and front, a good deal of cough, expectoration moderate; the abdomen much distended with fluid; on the other hand she was not emaciated; the appetite was good, and the temperature normal.

On the 9th June I opened the abdomen—length of incision two inches—evacuated a large quantity of fluid, and found the peritoneum thickened; peritoneum, intestines, uterus, and tubes thickly studded with tubercle.

The operation produced no shock, the wound healed rapidly, and she was discharged, decidedly improved in health, on the 23rd.

She was re-admitted on 19th July with the abdomen nearly as distended as before. The chest symptoms, however, were vastly improved, hardly any cough, respiratory sounds merely a bit rough, dulness almost gone.

On the 24th I re-opened the abdomen; there was no apparent improvement, except that perhaps the tubercles may have been smaller, but there was no reduction in quantity; they were all over the intestines, peritoneum, and down in pelvis, thickly scattered over uterus and appendages: the parietal peritoneum felt like sand paper. I can only compare the appearance of abdominal contents to the ice plant, if one could imagine its leaves red in place of green.

I sponged the abdominal cavity dry, then filled it two or three times with hot normal saline, each time, after turning patient on her side to pour out fluid, sponging the cavity dry. The

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operation lasted an hour, was well borne, but there was distinct reaction; temperature at 5 p.m. 104°, from which it fell steadily to 100°, next day to 99°, and next day to normal. The wound healed rapidly.

For nearly three months there was no fluid in the abdomen; the chest, however, showed evidence of increasing mischief in September, and at the end of that month fluid began to be apparent in the abdomen.

On 13th November I again operated, not with any hope of permanent good, but to give relief to the dyspnœa and tension, which were very distressing.

The incision, being merely for the purpose of evacuating fluid, was only two inches in length. I now found a very remarkable change in the abdomen, except a mass behind the liver—about the size of a hen's egg—*all the tubercles had vanished;* the peritoneum, the intestines, the pelvis and its contents, appeared perfectly healthy, and were smooth to the touch.

Thus it seems as if the second operation, with the washing and drying of the abdominal cavity, had cured the tubercular condition of the peritoneum and viscera, except behind the liver.

The lungs, however, went steadily from bad to worse, and she left the hospital with, indeed, much relief, but in a hopeless condition from pulmonary consumption.

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CLINICAL REPORT OF THE ROTUNDA LYING-IN HOSPITAL, FOR ONE YEAR, NOVEMBER 1ST, 1899, TO OCTOBER 31ST, 1900.

BY R. D. PUREFOY, F.R.C.S. (MASTER);

AND

H. C. LLOYD AND R. C. CARTON (ASSISTANTS).

[Read in the Section of Obstetrics, February 8, 1901.]

DURING the twelve months comprised in this Report 1,851 women were admitted to the Maternity Department, of whom 1,560 were confined and 291 were discharged, not being in labour; 2,109 patients were treated in their own homes.

TABLE NO. I.—*Admissions to Maternity Department.*

—	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct	Total
Total deliveries -	121	110	115	119	137	138	132	121	162	129	117	100	1,501
Total abortions -	8	2	9	7	6	4	5	4	5	8	5	6	69
Total cases treated	129	112	124	126	133	142	137	125	167	137	122	106	1,560
Patients discharged not in labour - -	25	12	20	22	21	23	30	30	33	27	18	30	291
Total admissions	154	124	144	148	154	165	167	155	200	164	140	136	1,851

TABLE NO. II.—*Dispensary for Out-Patients.*

Number of first attendances, - - -	4,332
,, repeated ,, - -	5,990
Total, - - - - -	10,322

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TABLE No. III.—*Showing Nature and Number of Cases Treated in the Extern Maternity*, 1899–1900.

Total number of cases	2,109	Multiple pregnancy, twins—	
Abortions	258	Female	10
Fœtal abnormalities—		Male	11
Anencephalus	2	Mixed	15
Hydrocephalus	3	Operations—	
Mole, hydatid	1	Curetting for abortion	126
Hæmorrhage—		Forceps	50
Accidental	9	Manual removal of placenta	20
Placenta prævia	14	Version	21
Post-partum	61	Craniotomy	1
,, secondary	2	Presentations—	
Hydramnios	11	Breech	61
Hæmatoma vaginæ	1	Brow	2
Inversion	1	Face	11
Mortality, infantile—		Footling	10
Macerated	14	Head and arm	3
Non-viable	40	Occipito-posterior	17
Premature	4	Shoulder	5
Recent	64	Transverse	9
Mortality, maternal	5	Prolapse of funis	16
		Rupture of uterus	1

EXTERN MATERNITY—INTERESTING CASES.

CASE I.—B. G., aged thirty-five, 10-para. Was delivered at full term. She had a history of intermittent hæmorrhage throughout the pregnancy. It was rather free after delivery, and continued for some time. There was an indurated, ulcerated surface on the cervix, with marked induration in the broad ligament of the same side.

CASE II.—*Inversion of the Uterus.* K. C., 1-para. During the third stage the student in charge requested the patient's mother to put her hand on the fundus for a few minutes. While he was out of the room she made an effort to expel the placenta, and the student heard the patient cry out. On his return hæmorrhage was taking place, and he at once sent for assistance. The hæmorrhage soon ceased. Ergot ʒii. had been administered, and the uterus was found completely inverted, the cervix tightly contracted, being palpable above the symphysis, and the fundus, covered with chorion, protruding from the vulva. The patient was collapsed and pulseless, but had lost very little blood. The fundus was replaced with difficulty by pressing the lowest part upwards with the fingers.

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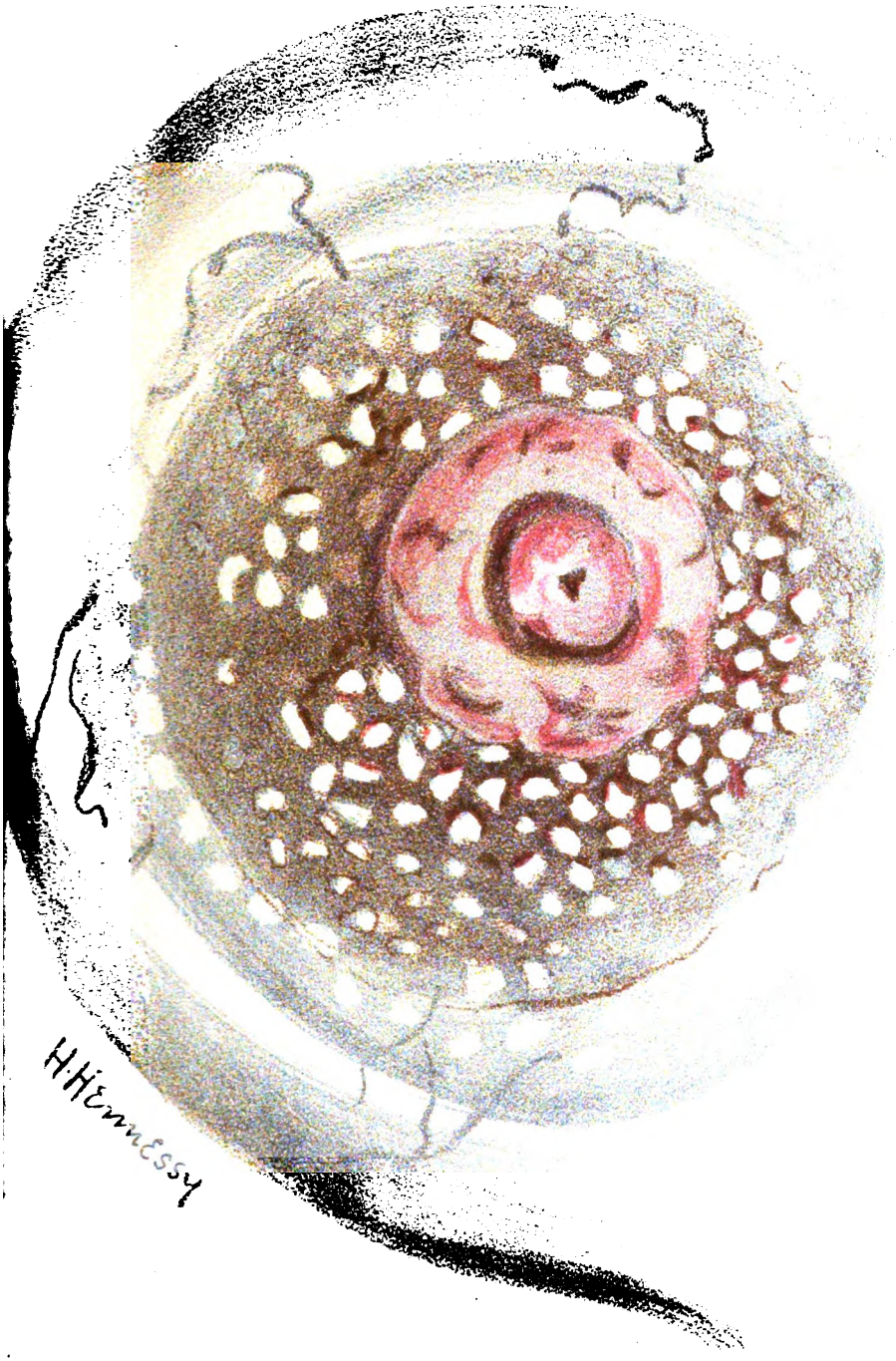

Unusual Pigmentation of Breast.

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The cervix yielded very slowly, but replacement was effected, and a slow convalescence followed.

Case III.—M. M., aged twenty-eight, 1-para; May 25th. *Placenta prævia lateralis.* Hæmorrhage was severe, and as the cervix was only sufficiently dilated to admit a finger, the vagina was plugged with boiled wool. When pains set in version was performed under chloroform, and five hours later a macerated fœtus with foul-smelling fluid was born. The temperature was then 102° F. with pulse of 144, and the curette was used. On the third day the temperature was 100·8° F., and afterwards normal.

Case IV.—A. I., aged twenty-five, 4-para. The child presenting as a breech had spastic contractions of all the flexors of the arms; the head was drawn backwards, and to the right there was scoliosis and intra-uterine fracture of both femora in the upper third.

Case V.—*Rupture of Parturient Canal.* A. F., 6-para; Aug. 29th. Was attended by a midwife, who, twelve hours after the rupture of the membranes, sent for assistance. The hand, and cord still pulsating, were in the vagina, with os admitting three fingers. Under chloroform the hand was passed gently into the uterine cavity, and a leg which was lying close drawn down. As the cord ceased pulsating rapid delivery was effected, but without avail. On passing the hand into the vagina a rent was discovered between the internal and external os, running circularly about one-third of the circumference, and opening into a smooth-walled cavity, in which the finger could be felt from the abdomen, but from which neither uterus nor bladder were palpable. This was plugged with iodoform gauze strips. The uterus contracted well, and the patient was put to bed. The gauze was gradually removed, the last coming away on the fifth day, and the patient had no rise in temperature throughout the puerperium.

Case VI.—*Craniotomy.* M. C., 4-para, with a history of difficulty in each labour; was found to have prolapse of the cord, with vertex presenting without pulsation in funis. As her pulse was 160, and she was having strong pains with the head above the brim, she was given morphin gr. ½, and the instruments sent for. Under chloroform the head was drawn down somewhat with forceps and perforated. The forceps were then removed and Auvard's cranioclast applied. There was some difficulty with the shoulders owing to the pelvic contraction. There was no *post-partum* hæmorrhage.

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DEATHS—EXTERN MATERNITY.

CASE I.—E. B., aged thirty, 7-para. *Post-partum hæmorrhage.* The placenta was completely adherent, and there had been very severe hæmorrhage before the patient was seen, the bed being saturated and full of clots, and the patient very anæmic, with pulse 140. The placenta was manually removed; there was no hæmorrhage during or after the operation, but the patient died shortly afterwards of syncope.

CASE II.—E. D., aged thirty-two, 2-para. *Post-partum hæmorrhage.* This patient was attended by a midwife, who sent for assistance two and a half hours after the birth of the child on account of hæmorrhage, the placenta not having come away. The patient was found to be blanched and almost pulseless, with short inspiration The placenta was expressed, and bleeding stopped. Everything possible was done to revive the woman, but she did not rally, and died a short time after.

CASE III.—M. B., aged twenty-six, 3-para. *Post-partum hæmorrhage.* Patient in a similar condition to the two last, with an adherent placenta. There was no hæmorrhage with or after removal of the placenta, but patient sank and died three-quarters of an hour later.

CASE IV.—M. A. F., aged twenty-eight, 2-para. *Phthisis and Sapræmia.* The lungs gave the physical signs of phthisis, and the patient was a very delicate looking woman. There was no difficulty about the labour, but on the second day, the temperature being 101·2° F., a vaginal douche was given, when a large hæmatoma was discovered running up the left vaginal wall from near the perineum to the fornix, sausage-shaped and firm, giving way below, where some blood clot was protruding. Daily douches were given, and on the fifth day the clots came out with considerable hæmorrhage. The cavity, which reached up to the symphysis, was douched and plugged with iodoform gauze. The lung symptoms gradually increased in severity, and the patient sank and died on the tenth day.

CASE V.—C. D., aged thirty, 2-para. *Accidental hæmorrhage.* When seen this patient had lost a very large quantity of blood. The bed was soaked, and blood was lying about the floor round the bed. She had a very feeble pulse, and was in a wretched condition of poverty. The husband was out of work, and a drunkard. The bleeding was apparently altogether external, as the fœtus (about

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eight months) could be palpated. The os would not admit the finger tip, and was hard. The vagina was plugged, and the patient bound up, but she did not rally, and died undelivered a few hours later. No *post-mortem* examination was obtainable.

TABLE No. IV.—*Showing Number and Nature of Cases Treated in the Intern Maternity.*

Total number of cases	1,560
Primiparæ	521
Abortions	69
Chorea	3
Deformed pelvis	19
Eclampsia	2
Epilepsy	3
Erythema scarlatiniforme	11
Delirium tremens	1
Hæmorrhage—	
Accidental	9
Placenta prævia	19
Post-partum	45
,, secondary	8
Hæmatoma vaginæ	1
Hydramnios	16
Hyperemesis	3
Insanity	8
Morbidity	126
Moles, hydatid	2
Mortality, infantile—	
Macerated	36
Putrid	2
Premature	18
Non-viable	15
Recent	32
Died in hospital	38
Mortality, maternal	6
Multiple pregnancy—	
Twins—	
Female	7
Male	6
Mixed	5
Triplets	1
Myoma uteri	10
Operations—	
Forceps	62
Induced abortion	8
Induced labour	4
Manual removal of placenta	29
Version	13
Cæsarean section	1
Hysterectomy	1
Pathological conditions in infants—	
Anencephalus	3
Cephalhæmatoma	5
Hydrocephalus	2
Icterus	272
Mastitis	2
Ophthalmia	7
Spina bifida and talipes	4
Hare-lip and cleft palate	2
Pemphigus	1
Physometra	2
Presentations—	
Breech	35
Brow	1
Face	6
Footling	21
Occipito-posterior	24
Transverse	4
Prolapse of funis	10
Puerperal ulcer	8
Rupture of uterus	2

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ABORTIONS.

There were sixty-nine cases treated in hospital during the year. Ten of these were complete, and required no treatment other than the removal of the ovum from the vagina. One of these patients had a retroflexion of the uterus, which was replaced with some difficulty. In three cases the uterine contents were expelled at the sixth month, one patient having syphilis and another repeated hæmorrhages for some weeks before admission, some of which had passed into the fœtal sac.

In eight the abortion was inevitable. They were all at or before the third month, and the ovum was removed with finger, and when necessary Rheinstädter's douche curette completed the evacuation of the uterus.

Forty-three patients were suffering from incomplete abortion. They were all curetted with the flushing curette. One was admitted with temperature 101·6° F. and pulse 130, but both were normal next day, and remained so. One who had been treated for three weeks before admission by drugs, and who came into hospital with a roll of bandage thrust into the vagina, which contained a quantity of blood clot, had a temperature of 102° on the second day, which fell to normal on the third. Only one other had a morbidity temperature, and from her a macerated fœtus of four and a half months was removed.

These three were the only cases of high temperature occurring in the cases of abortion. There were two cases of missed abortion in which no fœtus was found.

CHOREA.

Case I.—F. F., aged twenty-one, 1-para; Feb. 3rd. This patient, a very healthy woman, had choreic movements following an attack of typhus fever when five years old, without recurrence until three months ago. She had been a chorus girl in opera, and was on the stage the night before admission. The movements have been

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getting more violent lately, but on the stage she could control them. The movements, at first affecting only the arms, have now extended to the legs, face, and neck. She was not in labour on admission, and 14 days elapsed before pains came on. During this time she was taking arsenic in large doses, but the movements increased in severity. She threw away anything she attempted to hold, and bit pieces out of glasses; she could not protrude the tongue, and made grimaces. Forceps were applied under chloroform as soon as she came into the second stage, and a living child delivered. She had some sleep after this, but became gradually worse, and twice had attacks of screaming, and incoherence simulating mania. The fœtus showed choreic movements on birth, but these passed off. Bromide having no effect on her, hyoscin gr. $\frac{1}{200}$ was given with instant effect, producing sleep with dilated pupils and softened pulse. The bromides were continued four-hourly with hyoscin gr. $\frac{1}{100}$ when required, and on the fifth day she was able to talk rationally and feed herself. The temperature remained subnormal throughout the puerperium.

Case II.—A. M'K., aged twenty-three, 1-para; April 9th; was admitted with choreic movements affecting both sides. The next day she had a maniacal attack, and continued to be very excited. She was without sleep for 36 hours, though given bromides and morphin. After the administration of hyoscin gr. $\frac{1}{100}$ she became quiet and slept for four hours. This was continued each night with the same result. She came into labour on the 9th day with the head above the pelvic brim, and the child was born without the patient making any sign. Though the fœtal heart was heard three days before, the child was macerated. The pelvis was contracted, c. v. 3·1 in., and the head was collapsed. Soon after the birth of her child the mania and chorea disappeared. The temperature throughout was low, though the pulse at first was rather quick.

Case III.—H. M'D., aged twenty-four, 1-para; April 23rd; had choreic movements in right leg and arm for some months. She had suffered similarly as a child. There was enlargement of the thyroid on the left side. Forceps were applied for delay in the second stage and a living child delivered. The chorea gradually ceased after confinement. The puerperium was uneventful.

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TABLE No. V.—*Cases of Contracted Pelvis.*

Name	Age	Para	Pelvic Measurements					Mode of Delivery	Result to Child	Period of Pregnancy	REMARKS
			C. V.	Trans.	Ext. C.	I.-C.	I.-S.				
M. M.	19	I.	9·4	9·5	16·0	26·25	25·5	Forceps	A.	—	Head in cavity
M. B.	38	X.	—	—	—	—	—	Version	D.	—	—
M. L.	41	X.	—	—	—	—	—	Forceps	D.	—	Several previous instrumental labours. Head at brim, encircled in cervix, delivery of head and shoulders very difficult
A. S.	28	VI.	8·9	11·2	—	—	—	Natural	A.	8¾ months	Former labour high. (Forceps.)
M. S.	24	I.	6·5	10·5	—	—	—	,,	A.	5½ ,,	Two sacral promontories
M. D.	37	V.	8·5	11·0	18·25	24·75	27·25	—	A.	7 ,,	Deep depression in front of parietal region of infant's head
A. P.	26	I.	7·⅜	—	—	—	—	—	A.	7½ ,,	Brow. Rectification tried ineffectually; Cæsarean section (which see)
M. F.	21	II.	9·0	10·0	—	—	—	—	A.	7¼ ,,	—
W. C.	36	II.	9·0	11·0	18·0	29·0	25·0	—	—	—	Craniotomy on former occasion. Macerated
M. M.	23	I.	9·0	11·0	—	—	—	Natural	A.	8¾ months	—
M. O.	35	II.	—	—	—	—	—	Forceps	A.	8¼ ,,	Myoma, large size, on antero-lateral wall of uterus
M. C.	35	XI.	7·9	12·11	—	—	—	Version	A.	5½ ,,	Transverse presentation. Membranes ruptured by bougie which had been passed to induce labour
M. J.	24	III.	—	—	—	—	—	Forceps	—	7¾ ,,	Head allowed to mould in pelvis
A. Mc.	23	I.	—	—	—	—	—	Natural	A.	—	Patient choreic. See account. Macerated
K. K.	23	III.	7·25	—	—	—	—	,,	A.	6½ months	—
M. M.	27	VI.	7·8	13·1	—	—	—	Footling	A.	9¼ ,,	First child, forceps (at home), dead; next three, transverse, dead; fifth child in Rotunda last Jan., alive by version. Patient has two sacral promontories
S. M.	34	III.	9·0	10·5	—	—	—	Forceps	A.	8½ ,,	Induced labour
B. M.	38	III.	8·65	8·65	18·5	28·0	26·0	Natural	A.	7½ ,,	,, ,,
M. M.	30	IV.	10·0	10·0	18·0	27·2	23·0	Version	A.	7½ ,,	,, ,,

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ECLAMPSIA.

CASE I.—M. W., aged nineteen, 1-para; Jan. 16th. This patient, eight months pregnant, was sent in from the Extern Maternity after the administration of morphin gr. $\frac{1}{4}$. She had eight fits previous to admission, and one shortly after lasting one minute. Morphin gr. $\frac{1}{4}$ was then given. Three hours afterwards a vapour bath was given, and croton oil ♏ii. placed on the tongue. Five minutes later there was another fit, morphin gr. $\frac{1}{4}$ being again given. An hour later she was seized with an acute attack of mania, for which the morphin gr. $\frac{1}{4}$ was repeated. Labour had been progressing, and shortly after this the head came on the perineum. The movements now became so violent that chloroform was required to keep her on the couch, and in a few minutes a dead child was delivered. The urine was loaded with albumen, but there was no œdema. Her temperature, which was 102° F. on admission, fell to normal on the third day, and she went home on the eighth day in good condition. She had a scarlatiniform erythema on the 5th day which lasted 24 hours.

CASE II.—M. C. M., aged twenty, 1-para; Jan. 27th. Patient's friends stated that she was quite well the day before. She was about eight months pregnant. She suddenly had a fit, followed by two more, when assistance was sent for. After morphin gr. $\frac{1}{4}$ had been given she was ordered into hospital. She was admitted three hours later and morphin gr. $\frac{1}{4}$ was given immediately after a fit which lasted forty seconds; calomel gr. iii were given at this time. During the next two hours she had five fits, and then became very cyanosed. Croton oil ♏ii. in butter were placed on the tongue, amyl-nitrite ♏iii. inhaled, and digitalin gr. $\frac{1}{100}$ injected with fair results, but as the cyanosis continued 3 bags of oxygen were administered and repeated later with the amyl-nitrite. The urine contained a very small amount of albumen and there was no œdema. Four vapour baths were given at intervals of four hours, and she sweated freely in the last two. Late in the day the bowels were freely moved after an enema. Labour, which had commenced on admission, was slow, and as hydramnios was present, when a sufficient amount of dilatation had occurred, the membranes were punctured, a stillborn child weighing $5\frac{3}{4}$ lbs. being born three hours later. She was extremely ill next day; the temperature, which was 104·4° F. on admission, was 102·2° F., while the pulse fell from 150 to 126. She had all the physical signs of an exacer-

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bation of an old phthisis, and it was not till the 14th day that the temperature became normal. It remained so till the 20th day, when she left hospital.

TABLE No. VI.—*Accidental Hæmorrhage.*

Name	Date	Age and Para	Variety	Treatment	Result to Child	Remarks
1. R. B.	Nov. 13	34, ix.	Mixed	Plug and binder	A.	Expulsion in 12 hours
2. M. B.	Jan. 4	28, ii.	External	Rupture of membranes	A.	Os fully dilated pains good
3. M. D.	July 9	29, iv.	,,	Left to nature	A.	Hæmorrhage before admission none after; in labour, child expelled in 1 hour
4. N. G.	Mar. 30	32, xi.	,,	,,	D.	Child born soon after admission
5. M.M'C.	May 8	40, viii.	Mixed	Plug and binder	D.	In 8½ hours plug removed; os fully dilated; membranes ruptured
6. A.M.H.	Sept. 19	33, ix.	,,	,,	A.	Expulsion 9 hours
7. B. D.	Oct. 11	37, vi.	Internal	Left to nature	D.	Fœtus macerated; slight
8. A. B.	,, 16	26, i.	External	,,	D.	Hæmorrhage three weeks before admission
9. L. C.	,, 8	27, iv.	,,		A.	Hæmorrhage before admission, none after; in labour child expelled in 1 hour

In only three of these cases was it necessary to use the vaginal plug; all had had hæmorrhage more or less severe, and in all the cervix was undilated. In each case labour set in at once, and was terminated in a few hours without further loss of blood, the puerperium being uneventful.

Of the remainder, N. G. was admitted in a collapsed condition, with pulse of 120. She had been bleeding for a week. The ovum was expelled entire soon after her ad-

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mission, was accompanied by a gush of hæmorrhage, and some blood was found in the sac. The placenta from B. D. contained many patches of hæmorrhage, showing signs of having occurred at different dates, some of them being recent. The tissue was much destroyed. A. B. had a history of very severe hæmorrhage occurring four weeks before. Her husband on returning from work saw blood running from beneath the door, and on opening it found his wife lying unconscious, with blood round her and her clothes saturated. She was put to bed and hot bottles placed round her, but no further treatment was adopted. She was sent to hospital, but no history could be elicited at the time. She was very prostrate, but improved so much in a week that she was allowed to leave the hospital. On her second admission she was well advanced in labour, which was concluded without difficulty half an hour later. The fœtus was macerated, and had a bad odour. The placenta was detached over a considerable area *ante-partum*.

There was no rise of temperature in any of these patients during convalescence.

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TABLE No. VII.—*Placenta Prævia.*

Name	Date	Age and Para	Variety	Presentation	Period	Result to Child	Remarks
1. A. J.	Dec. 4	23, iv.	Lateral	Vertex	5 months	D.	Induced aborti
2. B. C.	,, 14	31, x.	,,	,,	6 ,,	A.	Slight hæmorrh left to nature
3. M. A. D.	,, 17	29, v.	,,	,,	8 ,,	A.	,,
4. K. D.	,, 24	36, iii.	,,	,,	8½ ,,	A.	Podalic versio
5. A. M'L.	,, 26	43, xvi.	,,	,,	7 ,,	A.	No hæmorrh after admissi left to nature
6. M. M.	Jan. 4	26, iv.	,,	Hand and head	6 ,,	D.	Induced labour
7. K. B.	,, 13	32, vi.	,,	Vertex	Full term	A.	Version; child lbs.
8. A. C.	Feb. 17	29, ii.	Marginal	Transverse	7 months	A.	Version
9. M. R.	Apl. 17	— viii.	Central	Vertex	7 ,,	D.	Version
10. B. B.	May 12	22, i.	Lateral	,,	8 ,,	D.	Version after pl
11. L. F.	June 6	23, i.	,,	,,	8 ,,	A.	Membranes ru tured; os ful dilated
12. M. C.	,, 12	35, iv.	,,	,,	Full term	A.	Vaginal plug
13. S. M'H.	July 24	30, i.	,,	,,	6 months	D.	Version
14A. S. K.	,, 29	24, iv.	,,	,,	Full term	A.	,,
15. B. B.	Aug. 11	26, x.	Marginal	,,	7 months	A.	,,
16. E. O'R.	,, 20	35, viii.	Lateral	,,	Full term	D.	Forceps. *See* "In teresting Cases'
17. E. N.	Oct. 2	23, iii.	,,	Breech	6 months	D.	Induced labour
18. S. G.	,, 11	30, xii.	Centralis	Vertex	8 ,,	D.	Version
19. M. M'G.	,, 6	25, i.	Lateral	,,	Full term	D.	Forceps. No hæ morrhage; *ante partum*

As will be seen, there was a very high percentage of this condition during the year, and in every case the mother left the hospital in good condition, though in four of the cases convalescence was prolonged.

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Podalic version was performed nine times, and the child delivered alive, except in two cases of central insertion of the placenta, and one where the pregnancy was terminated at the six month, the fœtus being anencephalic.

S. G., No. 18, had a morbidity temperature during convalescence. She was a very delicate woman, and had been treated in the hospital, when five months pregnant, in June the year before for repeated hæmorrhages (see last year's Report). She had never had a living child. The pulse was 120 and temperature 100° F. on admission.

In only two cases was there any *post-partum* hæmorrhage, and in both the placenta was adherent, requiring manual removal. When examination showed the cervix to be undilated, with hæmorrhage continuing, the vagina was plugged with boiled wool until sufficient dilatation had occurred to admit of the passage of the fœtal foot, and several of these cases were admitted from the Extern Maternity so plugged.

In the two cases in which forceps were applied labour was well advanced; there was a small amount of hæmorrhage, with the edge of the placenta felt at or near the cervix, the membranes were torn at the margin, and, on delivery, *ante-partum* detachment of a portion was seen to have occurred. Both had a prolonged labour, and the forceps were used on this account.

It was found necessary to dilate the cervix with tents in three cases, all at the sixth month. These patients sought admission on account of recurring hæmorrhages, and were detained for some days for observation before the operation was decided upon, and during that time more or less blood continued to escape. In one of them, after the tents had been used for two days, it was necessary to bring a foot down, delivery being then left to nature. She was a delicate woman, and there was a prolonged convalescence.

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Three patients were admitted from the Extern Maternity with the vagina plugged on account of hæmorrhage. Two had had repeated miscarriages, and neither had reached the sixth month. The third, M. A. D., had a living child. They all lay in hospital for some days after the removal of the plug without further hæmorrhage before the onset of labour. In the case of A. M'L. hæmorrhage occurred before admission on December 14th, and did not recur. She was in hospital for 12 days before pains set in, and on delivery the margin of the placenta was found to have been detached for some time.

The patient M. C., with the history and all the signs of severe hæmorrhage, was plugged on one occasion in the Extern Maternity, as the cervix was hard and undilated. The bleeding ceased, but labour did not ensue. She was plugged a second time and sent into the hospital. The plugs were then removed and she remained in bed until labour set in four days later. As there was then no loss she was allowed to deliver herself. It was found necessary to remove the placenta, which was firmly adherent in the lower segment of the uterus, encroaching on the internal os. The temperature was 100·2° the same night, rising to 103° the third day. The uterus was curetted, and afterwards plugged with iodoform gauze for two days, with a daily douche until the 12th day, when temperature was below 100° F. Next morning she had a "shivering," and the evening temperature remained about 103° for three days, after which it came down by lysis, and she was discharged in good condition on the 29th day.

POST-PARTUM HÆMORRHAGE.

There were seven cases of rather severe hæmorrhage. One of the patients had hæmorrhage on two occasions previously. In one a gush of blood took place with the birth of the child and ceased immediately. One occurred in a

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primipara who had twins after a very protracted first stage, lasting nearly three days. Both children were delivered by forceps, with some difficulty, as the cervix was not quite fully dilated. Delivery was considered necessary on account of the patient's condition. After the delivery, though the fundus contracted firmly, the cervix gaped, and the hæmorrhage was so free and hot douches failing to control it, that the uterus was plugged with iodoform gauze. The gauze was removed next day, and without further loss. The patient left hospital on the 10th day in good condition. Another of these cases was in a twin pregnancy, but the hæmorrhage was controlled without plugging the uterine cavity.

Three patients who had no hæmorrhage on the couch lost a considerable amount on being put to bed. Massage and the administration of ergot were sufficient treatment.

Two cases of concealed *post-partum* hæmorrhage were treated. In one the loss took place with the placenta still *in utero*, and after its expression good contractions took place. The other was some hours after delivery, when it was noticed that the patient was pale. The uterus was high in the abdomen, and a large quantity of clot was expressed along with some membranes.

In twenty-eight cases the hæmorrhage was slight. Five were forceps cases, and in one there was bleeding from two vessels in the vaginal wall. Some needed no treatment except massage. The rest were controlled by hot douche.

There were seven cases of secondary hæmorrhage, occurring in one case as late as the ninth day. They were due to subinvolution or retained membranes and yielded to suitable treatment.

HÆMATOMA.

Only two cases were seen in the Intern Maternity, and in one the condition occurred in the vagina. M. L., a

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primipara, delivered herself of a macerated child at full term. There was no difficulty in the confinement, and no lacerations occurred. On the third day, owing to a rise of temperature, a douche was given, when a swelling as large as a billiard ball was discovered on the posterior vaginal wall one inch from the cervix. It had opened, and blood clot was protruding; a large quantity was removed by the finger, the walls collapsing. A douche was given next day, after which convalescence was uneventful.

In a second case, a patient five months pregnant sought admission on account of hæmorrhage. The ovum was expelled, and a tumour as large as a fœtal head was found to the left side of the uterus. She had an ovarian cyst removed from this side four years before, and the abdomen had then to be re-opened for secondary hæmorrhage from some varicose veins in the broad ligament. Since then hæmorrhage has occurred into the broad ligament with each pregnancy. During the puerperium the swelling decreased very considerably in size.

HYDRAMNIOS.

It is of interest to note that of the sixteen cases of this condition only four had borne a living child at the last confinement. Of the remainder, four were primiparæ, five had aborted, and two had premature stillborn children, while one was not noted.

One occurred in the case of triplets, one is recorded under "Twins," and in one there was prolapse of the cord; another had eclampsia, *q.v.*, and in another there was placenta prævia.

Only four of the children lived. Two others, born alive, survived only a few hours. Three were anencephalic, and another had a spina bifida, and a third fontanelle on the frontal convexity. This patient's last child had a hydroencephalocele—*Vide* Reports, 1896-1897.

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HYPEREMESIS.

CASE I.—A. B., aged twenty-nine, 2-para. Was confined on Nov. 13th. She was seen when 3½ months pregnant, when she was in an extremely emaciated condition, and could walk with difficulty. She had been vomiting for some weeks, and was unable to retain food of any sort for some days. Examination proved that she had a retroflexed gravid uterus, but without any bladder symptoms. On replacing the uterus and applying a pessary the vomiting ceased, and she was admitted at full term in perfect health, and was delivered of a living child.

CASE II.—M. D., aged twenty-seven, 9-para; admitted Feb. 11th. Gave a history of a fall down-stairs on Feb. 3rd. Six days later she began to vomit, and this continued till admission, no food being kept down. She was in a very collapsed condition, no radial pulse being perceptible, and temperature of 95° F. Vomiting continued at intervals of 10 minutes. She was in labour on admission, and 1½ hours after delivered herself of a macerated fœtus weighing 8½ lbs. She was fed by the rectum, and morphia given hypodermically. The pulse, which could then be felt, ranged between 140 and 160. There was no abdominal distension. The vomiting ceased the same evening, and she was given hot water in small quantities, and later whisky and water by the mouth, with rectal alimentation every four hours. The next day the abdomen became tympanitic, pulse 150, and temperature 103° F., and she died in the afternoon after becoming comatose.

The *post-mortem* examination showed distended intestines, normal uterus, large white kidneys, and fatty liver. The bile duct contained several gall-stones, and there were several in the gall bladder. The stomach was enlarged.

CASE III.—A. C., aged twenty-eight, 2-para; March 18th. Had a history of vomiting for two weeks, and could not retain fluids. She was sent in by a doctor for this reason. She was at full term, and stated that she had an abortion in June of the year before. Her temperature was 99·6° and pulse 100 on admission. There was no recurrence of the vomiting; her bowels, which were very confined, were freely moved, and she delivered herself of a living child of 5¾ lbs. twelve hours later. Her temperature the same night was 100·8°, and she passed through a rather lengthy convalescence on account of some septic trouble; but during her stay in hospital she took nourishment freely, had no recurrence of the vomiting, and slept well.

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INSANITY.

There were eight cases, all of which were mania. One of them, A. M'D., has already been recorded under the mortality table; a second was a patient who had a twin pregnancy, and appears under "Forceps and Version." Another had also chorea, *q.v.* In two the fœtus was macerated. The majority of the cases were transient, and we obtained excellent results from the use of hyoscin (used hypodermically) in doses of gr. $\frac{1}{200}$ to $\frac{1}{100}$. This drug in nearly every case produced sleep, even when the patients were wildly maniacal. Three cases had to be afterwards sent to asylums. Several of the women were unmarried, and of the married ones at least two had very unhappy homes. We did not observe any preliminary rise in pulse or temperature, but two had some elevation of temperature with the onset of the mania, which could not be attributed to any other cause.

MYXOMA CHORII.

The first of these two cases, a 2-para, had a history of intermitting hæmorrhage for six weeks following a normal menstrual period. The ovum, as large as one of three months, was discharged before admission, and showed myxomatous change over half its surface.

The second, a 12-para, with pregnancy, dating three months, and continued hæmorrhage for three weeks, had the uterus as high as the umbilicus. The cervix was hard and contracted, and five sea-tangle tents were introduced. On their removal it was found necessary to introduce six more. Next day the contents, consisting of a gelatinous material with innumerable clear vesicles, apparently in suspension, were removed with a blunt curette.

MULTIPLE PREGNANCY—TWINS.

There were 18 cases of this variety during the year. The presentations were as follow:—

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Both Vertex	...	...	11
Breech and Vertex	...	...	2
Vertex and Breech	...	...	4
Vertex and Transverse	...	...	1

In one case there was hydramnios of the second sac, in which was a living female of 8½ lbs. The first sac contained very little fluid, and the child, weighing 5¼ lbs., was dead. One cord had a velamentous insertion.

As recorded under that heading, forceps were applied in four of the cases—in two of them to both children. In one of the vertex and breech cases in which forceps were used, the patient was seven hours in the second stage, and there was, in addition, threatened eclampsia. In one case there was a deep groove on the parietal bone where it rested on the promontory. The child was in asphyxia pallida, and did not recover. The second child was also born dead, the arms extending and being extremely difficult to deliver. This patient was a primipara.

In four cases there was *post-partum* hæmorrhage, one having an adherent placenta. In a second the hæmorrhage was so severe and the contractions so poor that the uterus was plugged with iodoform gauze. There was also a small wound in the vaginal wall over the right ischial tuberosity, which was sutured.

Six of the infants were stillborn, one being macerated, two premature (6½ months), and in one case where both were dead no life had been felt for two days.

In four cases there was a morbidity temperature.

TRIPLETS.

Only one case was treated. The patient was phthisical, and was in a low state of health; there was hydramnios of the second sac. The children, who were all males, and weighed respectively 4, 4, and 3½ lbs., were born alive, and lived a variable time up to six days. There was only one

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placenta, and each child presented as vertex. The mother, who had an exacerbation of her lung affection, passed through a somewhat prolonged convalescence, and left the hospital at the end of the third week.

An inspection of the following Table, enumerating the cases having fibroid disease of uterus, shows:—

1. That the majority were under thirty years of age;

2. That labour was generally uneventful, terminated by natural efforts, and followed by favourable puerperium.

In many cases a marked diminution in size of tumour followed delivery. In no case was there any serious hæmorrhage, though in some the pains were probably weakened by the abnormal condition present.

TABLE No. VIII.—*Cases of Uterine Fibroid.*

Name	Age	Para	Presentation	Period of Pregnancy	Child	REMARKS
C. B.	38	II.	Vertex	7½ months	A.	Large fibroid on either side of uterus
A. F.	22	II.	„	7½ „	A.	Fibroid size of orange, becoming very hard during pains
J. B.	22	I.	„	6½ „	A.	Nodule on right cornu
M. B.	27	VII.	Breech	—	A.	Nodule on left cornu
E. M.	23	II.	Face	8⅝ months	A.	Large nodule on fundus
N. D.	25	I.	Vertex	7½ „	A.	Small fibroid on fundus
M. M.	32	XI.	„	9½ „	A.	Small fibroid on right cornu
A. F.	20	I.	Forceps	6½ „	A.	Two large fibroids at fundus
E. M.	30	I.	Breech	6½ „	A.	Large fibroid on left side
E. C.	37	I.	Footling	Putrid	D.	Small nodule anteriorly
M. O'C.	35	II.	Vertex	8½ months	A.	Fibroid anteriorly

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TABLE No. IX.—*Application of Forceps.*

Indications	—	Dead Children	Remarks
Delay in 2nd stage, with danger to mother -	40	6	
Threatened death of fœtus - -	6	—	
Threatened rupture of uterus - -	1	—	
Threatened eclampsia -	4	3	
Pelvic contraction -	6	—	
Prolapse of cord -	1	1	
Placenta prævia -	1	1	
Chorea - - -	2	—	
Pleurisy - -	1	—	
Total, -	62	11	

SUB-TABLE A.—*Showing Number of Pregnancy.*

I.-para -	49	V.-para -	1
II.-para -	6	VII.-para -	1
III.-para -	5	Total -	62

SUB-TABLE B.—*Showing Ages of Primiparæ.*

17–25 - -	23
26–30 - -	19
31–35 - -	5
36–40 - -	2
Total -	49

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FORCEPS.

Of those cases in which there was pelvic contraction, one had been delivered by forceps in her first pregnancy, 16 months previously, when the child, which presented occipito-posteriorly, was stillborn. She had, in addition, a fibroid as large as a fœtal head on the left side of the fundus. On this occasion she was straining so violently that a rupture was feared, and the instruments were applied soon after the dilatation of the os. The child, which weighed 8½ lbs., was born alive.

Another patient had, in addition, threatened eclampsia, great œdema and scanty urine. She was treated for the latter condition for some days, and improved greatly before the onset of labour. The child was stillborn. The fœtal heart was heard before delivery, and with os only half dilated the forceps were applied on account of its slowness. One patient with narrowing of the subpubic arch was found to have a laceration over the ischial tuberosity, into which two fingers could be passed. It was united by a suture and the convalescence was uneventful.

Another admitted, membranes ruptured two days before, and whose pelvis was contracted by an exostosis at the back of the symphysis, as well as a prominent promontory, had also œdema and anasarca, with albuminous urine. She had been previously delivered by instruments, and was a 10-para. With the head above the brim, as her pulse and temperature were going up, forceps were applied, and after traction for one and a half hours, gentle at first, until the cervix had retracted, the head was delivered. The shoulders were then impacted, and the child did not survive delivery. There was no morbidity temperature during convalescence.

There was no difficulty in delivering those with threatened eclampsia who had not, in addition, pelvic

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contraction. Three of the children were stillborn, and three of the mothers had some rise of temperature while in hospital.

A considerable amount of traction was required in four cases with persistent occipito-posterior presentation, and some difficulty was experienced in locking the blades in one. One child was stillborn, and had been dead for some time, forceps being applied on the mother's account. All made good convalescence.

Two patients had chorea, *q.v.*

Fibroids were present in four of the cases, and one had prolapse of the cord. In this case the face escaped posteriorly, but at once rotated forward. The child was alive.

The two cases with lateral placenta prævia are recorded elsewhere.

Forceps were required in four cases of twins, and in two of them both children were so delivered. There was, in addition, threatened eclampsia. In another, labour had been going on for three days, and both children were alive; difficulty was caused on account of incomplete dilatation. In the case of another the second child was delivered by podalic version. All were primiparæ.

One patient had physometra, and passed through a prolonged convalescence of 11 days, and one developed mania on the second day.

In fifteen a morbid temperature was registered during convalescence. There was only one case in which forceps were applied at the brim. The patient had a contracted pelvis, *q.v.*

INDUCTION OF ABORTION.

There were eight cases in which it was considered necessary to terminate pregnancy before the child became viable. Two were before the end of the fourth month; in

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each case the patient was having repeated hæmorrhages. The cervix was dilated by means of sea-tangle tents, and the uterus emptied by Rheinstädter's curette. The remaining six cases were all between the fifth and sixth months, and were suffering from severe and repeated hæmorrhages, two of them being due to the placenta being attached to the lower uterine segment. In three of these labour ensued shortly after the insertion of the sea-tangle tents, but in the remaining three some delay occurred, the operation not being complete for from three to five days. In one after the removal of the tents the vagina was plugged with boiled wool for two days. The second had tents inserted on two occasions, and on the third day the membranes were punctured, and version performed, delivery occurring shortly after. These all had normal puerperia. The last case had been bleeding for five weeks before admission, and was six months pregnant. As the hæmorrhage continued after she was admitted five sea-tangle tents were inserted, and the vagina was plugged with boiled wool. Next day nine tents were used, and the vagina again plugged. She delivered herself next day six hours after a foot was brought down. The placenta, which was adherent, was removed digitally, and the uterus curetted. The tempeature did not rise above 99° F. until the eighth day, when it ran up to 103° F., with a pulse of 140. The uterus, which was rather large and soft, was again curetted, and, as the temperature reached 104° F. next night, it was plugged with iodoform gauze after douching. This was repeated each evening until the sixteenth day, when the temperature and pulse were again normal. The gauze was then removed, and she left hospital five days later in good health.

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MANUAL REMOVAL OF THE PLACENTA.

In twenty-nine cases this operation was required; only three of the patients were primiparæ, one being a forceps case, and another was delivered of a macerated premature fœtus. One who had eight children before had adherent placenta on each occasion.

There was morbidity temperature in three cases, one of the three being admitted with a temperature of 100° F. The other two were detained in hospital till the twelfth day.

VERSION

Was performed 13 times. Nine of these are fully described under "Placenta Prævia," and three under "Transverse Presentation." The last will be found described in the case of "Rupture of the Uterus."

INDUCED LABOUR.

In four cases labour was induced on account of pelvic contraction by the introduction of bougies into the uterine cavity while quinine was administered, and in two cases the continuous current was used to hasten the advent and improve the character of the pains. A period of thirty to fifty hours often elapsed before regular and persistent pains set in; indeed, in one instance a week elapsed from the beginning of the proceeding till the completion of labour.

Nineteen cases of contracted pelvis came under observation. In one, a primipara, the brow presented; and as efforts to substitute the vertex were unavailing, Cæsarean section was performed, and mother and child were safely delivered.

In 5 cases delivery was effected with the forceps, in 3 cases by version, and in 10 the natural efforts were sufficient.

The puerperium was retarded in one instance by chorea. The largest of the infants weighed 9½ lbs.; presented by the feet, and was delivered alive.

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CÆSAREAN SECTION.

A. P., aged twenty-six, 1-para. Admitted July 9th, 1900, in strong labour. Was found on palpation to have the head above the brim, presenting as a brow. This was confirmed by vaginal examination, the os admitting two fingers, and the membranes were found to be ruptured. By Ziegenspeck's manœuvre, under chloroform, an attempt was made to produce a vertex presentation, but it was impossible to maintain the head in this position. On measuring the pelvis with Skutsch's pelvimeter the conjugate was found to be 7·25 cm. As the fœtal heart was becoming slow, with a caput formed on the presenting part, and there was a threatening of rupture of the uterus, Cæsarean section was performed. The child was delivered in three minutes from the start of the operation, and cried lustily. It was a female, and weighed 7¾ lbs. The placenta was quickly removed, and the uterine cavity packed with sterilised gauze sponges. The uterus was then sutured with interrupted silk sutures through to the endometrium, and the abdomen closed, the sponges being first removed from the vagina, and a douche of sterilised water given from above. The patient made a good convalescence, and left the hospital with a healthy child on August 15th.

HYSTERECTOMY AND RUPTURE OF THE UTERUS.

Case I.—M. B., aged thirty-eight, 10-para; September 30th. The last three labours had been difficult, and terminated by instruments. She had been 6½ hours in labour, was having good pains, and the os half dilated, with a large head at the brim, resting on a prominent promontory. There was some head moulding, and the membranes ruptured soon after admission, with escape of a large quantity of liquor amnii. The pulse, which was rapid on admission, shortly after became quicker and rather feeble, and pains ceased, and the fœtus was very readily felt on palpation, with a flaccid uterus. There was a slight red discharge, and on vaginal examination the head was found to have receded. There was some vomiting. On passing a hand into the uterus the head receded without effort, and a foot was felt lying near the pelvic brim, and was drawn down. The body readily followed, and the head was delivered without difficulty by combined traction and pressure above the brim. On again passing the hand it entered the peritoneal cavity in front of the cervix, which was detached in three-fifths of

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its circumference. The bladder was uninjured. The placenta was removed from the uterus, which contracted well, and, as hæmorrhage continued, some iodoform gauze was passed through the rent. A couple of hours later the abdomen was opened. Some vermix was wiped out of the peritoneal cavity, and a small quantity of blood. The peritoneum was found detached from the bladder wall in a flap, the rent running also down the right side, exposing the uterine vessels. Panhysterectomy was performed, the sutures drawn into the vagina, and a plug of gauze passed through after washing the pelvis out with sterilised water. The patient stood the operation fairly well, but did not rally well. Vomiting ceased, but she sank and died on the third morning. Nothing was found on *post-mortem* examination to account for death. The child, which weighed 10½ lbs., was stillborn.

Case II.—E. O'R., aged thirty-five, 8-para; August 20th. This patient, at full term, had *ante-partum* hæmorrhage, with a low implantation of the placenta and hydramnios. With an os admitting four fingers, and head above the brim, the placental margin could be felt. On puncturing the membranes nine pints of liquor amnii escaped. Labour was allowed to progress, as hæmorrhage had ceased and the vertex was descending, but as the pulse became frequent and pains weak, forceps were applied, and the child delivered with ease. In applying the blades there was some escape of dark-coloured blood, and after delivery the hand was introduced and a tear found immediately outside the internal os, running round one-third of the circumference of the cervical canal, parallel to the os, and opening into the left broad ligament. The cavity was plugged through the rent with iodoform gauze after a douche of sterilised water. The pulse was 120, and patient pale. Next day there was some abdominal distension and slight pain; some gauze was removed, and a hot fomentation applied to the abdomen. On the third day the whole of the gauze was removed, and throughout the puerperium no rise of temperature occurred. The patient has since been seen, and is again pregnant.

PHYSOMETRA.

Case I.—E. C, aged thirty-seven, 1-para; July 15th. Admitted with temperature 101·8° F., and radial pulse absent, the heart beats 160. Her face was livid. She gave a history of vomiting and some pains two weeks before, but these passed off, and she

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was going about as usual. On the morning of admission she again had pains, but had no knowledge of the escape of liquor amnii at any time. Since last feeling fœtal movements (?) four days ago, there has been a gradual enlargement of the abdomen, and it was found to be distended and resonant over the whole surface, the uterus itself giving a tympanitic note. There was a large soft swelling in the right iliac region, and a firm nodule at the uterine cornu on the same side. The cervix was found dilated to almost full extent, and a foot from which the epidermis peeled lay in the vagina. Stimulants were administered, and the foot drawn down. A quantity of fœtid gas escaped from the vagina, and a decomposing child with hydrocephalic head was delivered, being followed by green fœtid fluid and gas. The patient died immediately after the removal of the placenta.

Post-mortem.—The uterus was large and soft, studded over with fibroids of various size, a soft interstitial myoma occupying the right iliac fossa.

Case II.—L. W., aged twenty-six, 1-para; Jan. 16th. In labour for an unknown period, but without pains for some days; had considerable abdominal distension; the uterus was difficult to map out, and there was marked tympany over the right side of abdomen. The os was fully dilated, pulse 144, and temperature 101·8°, no fœtal heart being audible. On applying the forceps a very fœtid gas escaped from the uterus, and some green fluid. The child was dead. There was some trouble in delivering the shoulders, and the perineum sloughed, prolonging convalescence to the eleventh day.

BREECH PRESENTATION.

There were 35 cases during the year, and of the nine infants which were stillborn five were macerated, two in cases of *ante-partum* hæmorrhage. Only one had reached full term, and in this case there was no difficulty in delivery.

Of the remainder, five occurred in twin pregnancies, and one had prolapse of the cord. In only five of the total number was assistance required for delivery of the arms or head. Of the total number, 11 children were premature, six of these being stillborn.

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FOOTLING.

Amongst the 21 cases presenting by the feet two had hydramnios, two placenta prævia, two prolapse of the cord, and one was in a twin pregnancy.

Ten of the children did not survive, two being macerated, and the only viable one lost its life through difficulty in delivering the shoulders and head. One of the infants was anencephalic, and this condition was associated with hydramnios. Another infant had spina bifida, and died shortly after birth.

All those infants born alive had reached full term, and in six interference was required to complete delivery. Four others are recorded under "Contracted Pelvis," "Prolapse of the Cord," and "Physometra" respectively.

BROW PRESENTATION.

The only case will be found reported fully under "Cæsarean Section."

FACE PRESENTATION.

Of the six cases five were delivered by natural efforts. Two of these were anencephalic fœtuses associated with hydramnios. In another, with an 8¼ lb. child, there was prolapse of the cord, and one hand lay over the mouth. In none of these was labour prolonged, and two of the patients were primiparæ.

The sixth patient, also a primipara, was 20 hours in labour, and the face was engaging in the brim, with membranes unruptured, and os one-third dilated. Schatz' method failing to convert the presentation into a natural one, Ziegenspeck's manœuvre gave satisfactory results. The membranes were then ruptured, and a tight binder applied, and the patient delivered herself two and a half hours later. The child weighed 8½ lbs.

All these children, except the anencephalic ones, were born alive.

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OCCIPITO-POSTERIOR PERSISTENT.

Forceps were applied on account of delay with signs of distress in only four of the 24 cases of this condition, one of them being the first of twins.

Of the total number 10 were primiparæ, and all the children except one were born alive. In only one was there undue lengthening of labour, and one of the patients, a 6-para, in labour only three and a half hours, had a child weighing 9 lbs.

TRANSVERSE.

Of these four cases, one occurred with the second child in a twin pregnancy. In two the shoulder presented, and one of them had the additional complication of lateral placenta prævia. In one of these, and the fourth case, which was premature, the children were stillborn.

TABLE NO. X.—*Prolapse of Funis.*

Name	Age	Date	Para	Period of Pregnancy	Presentation	Result to Child	Remarks
1. C. C.	41	Dec. 25	VII.	Full term	Breech	A.	Rapid delivery; child died in evening
2. H. D.	23	,, 28	I.	,,	Vertex	A.	Forceps after replacement; second of twins
3. S. E	30	Feb. 5	IV.	,,	Face	A.	Cord noted only with birth
4. M. G.	24	Apl. 29	II.	,,	Vertex	A.	Head on perineum, expressed
5. M. G.	32	May 9	II.	,,	,,	A.	Rapid labour
6. S. M.	19	June 1	II.	,,	Footling	D.	Rapid extraction; cord pulseless
7. R. B.	24	,, 10	II.	,,	,,	A.	Rapid extraction
8. E. C.	32	,, 20	II.	,,	Vertex	D.	Forceps
9. J. R.	35	July 3	IX.	7½ months	Footling	D.	Cord had ceased pulsating
10. E. K.	29	Sept. 8	II.	Full term	Vertex	D.	,,

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In the case of C. C. there was some delay with the birth of the shoulders. The child died the same evening.

H. D. had a very prolonged labour with a twin pregnancy. The first child was delivered with forceps, and on rupturing the membranes of the second the cord prolapsed, but was replaced, the child being delivered by forceps also.

S. M.—There were faint pulsations in cord. Death of the child due to arrest of head at brim.

E. C.—The cord had ceased pulsating, and no fœtal heart was audible, so the case was left to nature. Forceps were applied later on for delay in labour.

TABLE No. XI.—*Morbidity.*

Temperature	Nov.	Dec	Jan	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total
100·8° to 101·2° F.	3	2	3	2	3	3	6	4	8	5	2	5	46
101·2° to 102·2° F.	4	8	4	3	2	5	1	4	6	3	5	3	48
102·2° to 104° F.	2	5	8	1	2	2	2	3	6	3	4	1	39
104° F. and over	–	–	–	–	–	1	1	1	–	1	1	–	5
Total monthly	9	15	15	6	7	11	10	12	20	12	12	9	138
Percentage	6·9	8·9	11·9	4·7	5·2	7·7	7·3	9·6	12·0	8·7	9·8	8·4	8·8

SPECIFIC CAUSE OF MORBIDITY OTHER THAN SEPSIS.[a]

Influenza	11	Mania	4
Mastitis	6	Phlebitis	1
Bronchitis	9	Syphilis	1
Phthisis	2	Gonorrhœa	1
Pleurisy	1	Abscess of finger	1
Constipation	2	Delirium tremens	1
Eclampsia	2		
		Total	42

[a] These are included in the numbers in the table above.

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MORBIDITY.

Of those patients under the first heading—viz., 100·8° to 101·2° F.—nine with an otherwise normal puerperium had once, and in two cases as late as the seventh day, a rise of temperature, which subsided again without treatment. Seven are included in the sub-table. The remainder were mild cases, giving no cause for anxiety, and the temperature in almost all of them fell immediately after treatment, being due to small pieces of membrane or blood clot.

With temperature 101·2° to 102·2° F. twelve are included in the sub-table. Of the remainder four had puerperal ulcers. One after a normal puerperium had secondary hæmorrhage on the eighth day, and a rise of temperature the same evening. One was the case of Cæsarean section, who had the rise the second day after operation, and was normal afterwards. In all but twelve the temperature fell again after one rise with treatment, and in these there was a gradual return to health.

From 102·2° F. to 104° F. nineteen are included in the sub-table, or had no treatment, with a sudden rise on one occasion only. Two of these were mania cases. Seven of the septic cases had high temperature during the first three days, and left hospital well on the eighth day. The others had prolonged convalescence. One was an interesting case of pustular vaginitis. The vagina was a purple colour with a row of pustules running down the lateral wall of the vagina. One occurred in a case of eclampsia admitted with temperature of 103·4° F., with phthisis. One was a case of induced premature labour for hæmorrhage. Three had perineal ulceration. One was the case of triplets, the patient being phthisical. In one there was a deep perineal laceration, and the patient had some sloughing in the pelvis, and was detained two months in

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Unusual Skin Condition during Puerperium.

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Unusual Skin Condition during Puerperium.

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of Buhl's Disease

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hospital. Another occurred after a forceps delivery of a putrid fœtus. These all left hospital well.

Of those above 104° F., one died of miliary tuberculosis. One had influenza, with temperature 105·2° on the second day, and then normal.

One who had a temperature ranging between normal and 105° F. for nine days, and who had tympany, had her baby born in the lodge, and no cultures could be obtained from curettings from the uterus.

One whose temperature reached 106° F. had condylomata on the vulva, and a clump of hard, yellow, sago-like nodules in both vaginal fornices. She was under treatment for 30 days. The baby, which weighed 3¾ lbs., had ophthalmia.

The last, with perineal ulceration, left hospital on the 9th day, the temperature occurring on the second, and coming to normal on the fourth.

There was no vaginal examination made in 63 of the cases which afterwards developed sepsis.

TABLE No. XII.—*Mortality.*

Name	Age	Para	Admitted	Delivered	Died	Cause of Death
M. D.	27	IX.	Feb. 11	Feb. 11	Feb. 12	Hyperemesis and Bright's disease
R. M'D.	22	I.	April 10	April 10	April 24	Acute miliary tuberculosis
M. F.	40	II.	June 2	June 2	June 8	Pulmonary embolism
E. B.	24	VI.	July 2	July 2	July 2	Advanced renal disease
E. C.	37	I.	„ 15	„ 15	„ 15	Physometra and embolism
M. B.	38	X.	Sept. 30	Sept. 30	Oct. 2	Rupture of parturient canal

CASE I.—Recorded under "Hyperemesis."

CASE II.—A. M'D, a single girl from the country, who stated that she had been sleeping out for some nights, admitted with

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severe cough from bronchitis. Had several rigors before admission. Her labour was short and easy. Thirty-six hours later she had a maniacal attack, which was quieted by hyoscin gr. $\frac{1}{75}$. For fœtid lochia the uterus was curetted on the fifth day. Two days later crepitations could be detected at the right apex. As she continued to be noisy at intervals, she was placed in an isolation ward. She was latterly sleepless, with wide staring eyes, very rapid breathing and pulse, but no expectoration, though rhonchi were heard all over the chest. On the 14th day the temperature rose to 107° F., and she died.

The section revealed acute miliary tuberculosis of lungs, pericardium, spleen, liver, and kidneys, with a healthy uterus and appendages.

Case III.—M. F. Admitted with severe asthma and bronchitis. She delivered herself, and improved somewhat for a time, but on the fifth day she was so bad that she had to be propped up in bed to breathe. While taking a drink she suddenly expired. No autopsy was obtainable.

Case IV.—E. B., aged twenty-four, 6-para. Was brought to the hospital moribund by her friends, who wished her to be opened before death on account of the child. She lived one hour after admission. *Post-mortem* examination proved her kidneys to be very extensively diseased. The child was macerated.

Case V.—Recorded under "Physometra."

Case VI.—Recorded under "Rupture of Uterus."

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Table XIII.—List of Cases Treated.

Disease	Total	Cured	Improved	Not Improved	Died	Remarks
Vulva—						
Bartholinian abscess	1	1	–	–	–	
Labial epithelioma	2	–	2	–	–	
Labial Hæmatoma	1	1	–	–	–	
Perineum—						
Lacerations, simple	39	39	–	–	–	
„ complete	5	5	–	–	–	
Rectum—						
Hæmorrhoids	1	1	–	–	–	
Prolapse	1	1	–	–	–	
Urethra and Bladder—						
Cystitis	6	6	–	–	–	
Caruncle	4	4	–	–	–	
Ulceration	1	1	–	–	–	
Stricture	1	1	–	–	–	
Incontinence of urine	1	1	–	–	–	
Carcinoma	1	–	–	–	1	
Calculus	1	1	–	–	–	
Vagina—						
Cicatrix and stenosis	1	1	–	–	–	
Cysts	1	1	–	–	–	
Cystocele	16	13	3	–	–	
Epithelioma	–	–	–	–	–	*See* "Uterus"
Fistula, vesico-vaginal	3	2	1	–	–	
Laceration	1	1	–	–	–	
Rectocele	8	7	1	–	–	
Vaginitis	6	6	–	–	–	
Circular constriction of	–	1	–	–	–	

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TABLE XIII.—LIST OF CASES TREATED.—*con.*

DISEASE	Total	Cured	Improved	Not Improved	Died	REMARKS
CERVIX—						
Carcinoma	5	–	5	–	–	
Erosions	–	–	–	–	–	
Hypertrophy	–	–	–	–	–	
Lacerations	39	36	3	–	–	
Stenosis	–	–	–	–	–	
Cyst	1	1	–	–	–	
CORPUS UTERI—						
Abortion, Incomplete	32	32	–	–	–	
„ Threatened	–	–	–	–	–	
Carcinoma	14	–	4	10	–	In many cases vagina involved
Endometritis	69	46	23	–	–	
Fibroids	14	6	8	–	–	
Pathological Anteflexion	1	–	1	–	–	
Polypus	16	16	–	–	–	
Procidentia	4	3	1	–	–	
Prolapsus	–	–	–	–	–	*See* remarks, *infra*.
Retro-displacement	57	26	29	2	–	
„ with pregnancy	1	1	–	–	–	
Subinvolution	17	17	–	–	–	
Sapræmia, following delivery at home	2	1	–	–	1	
FALLOPIAN TUBES—						
Pyosalpinx	11	7	3	–	1	
Salpingitis	14	3	11	–	–	
Tubal pregnancy	2	2	–	–	–	
Hæmatosalpinx	1	1	–	–	–	
Perimetritis	23	7	15	1	–	
Parametritis	16	5	11	–	–	

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TABLE XIII.—LIST OF CASES TREATED.—*con.*

DISEASE	Total	Cured	Improved	Not Improved	Died	REMARKS
OVARIES—						
Cystic - - -	19	–	–	–	–	
Cysts - - -	18	16	–	–	2	
„ Dermoid, Abscess of	2	2	–	–	–	
Sarcoma - -	2	–	–	–	2	
ABDOMEN—						
Tubercular peritonitis -	–	1	–	–	–	
Hernia - - -	2	1	–	–	1	
MISCELLANEOUS—						*See* Table "Miscellaneous"
Menopause	1	–	1	–	–	

VULVA AND PERINÆUM.

Many of the commoner diseases of the external genitals were unrepresented amongst the patients admitted during the year to which this report refers. Perinæal lacerations were mostly dealt with, as heretofore, by Tait's procedure, preceded by curetting. In a few instances Hegar's colpo-perineorrhaphy was deemed preferable.

RECTUM.

Prolapse.—The only case of this admitted was in an elderly, very unmanageable subject, who had suffered from it for many years. The cautery was freely applied on two occasions, and she left the hospital quite free from this most distressing ailment.

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VAGINA.

Vaginitis.—Besides the cases of this specially reported, there were some of less severity, associated with uterine troubles. Pyroligneous acid was in all used with benefit.

Cicatrix and Stenosis were treated by division and subsequent plugging of the vagina with gauze.

V. V. Fistula.—In the one case not cured the fistula was quadrangular and of large size, associated with suppurating parametritis, opening into bladder, complete loss of perinæum, and some portion of anterior rectal wall. The fistula was reduced in size.

Sinus.—A patient who had been delivered at her own home (private) by craniotomy, on account of extreme pelvic narrowing, sought advice on account of a sinus opening in labium and right vaginal wall, and leading to diseased bone. Dilatation and douching effected considerable improvement.

CERVIX.

Lacerations.—Those calling for operative treatment were mostly bilateral; and if associated with hypertrophy and erosion Schröeder's operation was generally chosen.

Carcinoma.—This was in every case under observation so advanced as to forbid radical treatment, but in some Marion Sims' treatment was adopted with temporary relief.

UTERUS.

Endometritis.—In the treatment of this, dilatation followed by curetting was the first step, and in most cases was followed by the intra-uterine injection of iodised phenol a few days later. This injection was sometimes repeated once or twice, when the conditions present required it. Pyroligneous acid applied with Bandles' sound also proved of much use in these cases. In one case numerous polypoid growths were removed from the endometrium.

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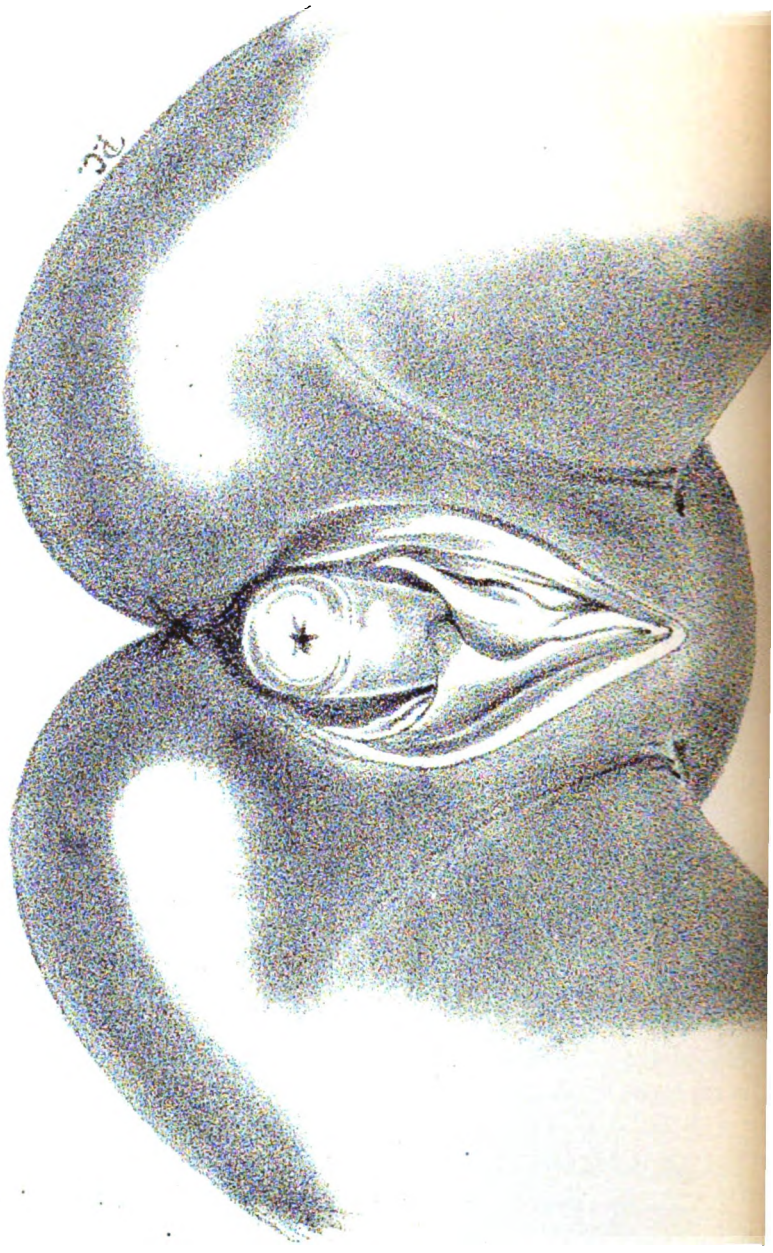

Hypertrophied and Procident Cervix Uteri.

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One case of pathological anteflexion came under notice.

Prolapsus.—In conjunction with cystocele and rectocele, with which it was mostly associated, this condition was generally relieved by some plastic operation.

Fibroids.—In six cases where the growths were large and giving trouble, panhysterectomy was successfully performed, and in eight, curetting was deemed sufficient, as the uterus was not much enlarged, nor the attendant symptoms serious.

Retro-displacements. — In the proportion stated I had reason to think a cure was effected, especially as in some pregnancy proceeded to full term subsequently. Every year I am more convinced of the lasting benefits which may be secured for our patients so affected by the use of a well-chosen pessary.

Sapræmia.—Two patients so affected were admitted from our extern maternity, and in one our utmost efforts were unavailing in preventing a fatal termination.

FALLOPIAN TUBES.

Tubal Pregnancy.—Two patients with this condition were under treatment and both recovered after operation. In one case of great interest, fully narrated later on, pyosalpinx was also present.

Salpingitis.—Much improvement by douching, ichthyol tampons, &c., was obtained in many cases of this affection, and the operations for the removal of pyosalpinx were, with one exception, successful. In one of them, as also in one of the cases of tubal pregnancy, vaginal drainage proved most successful.

Case 7 deserves notice on account of the large size of the pyosalpinx, the long duration of the disease, and the physical suffering it induced. My experience in this and some other cases impressed me with the importance of an exploratory laparotomy before deciding on vaginal drainage.

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In this case it would have been impossible to carry out the proceeding safely without the guidance of a hand in the peritoneal cavity. In Case 9 laparotomy afforded similar valuable information. On opening the cœlom I found and removed a pustube, the presence of which had not been previously suspected. On making the vaginal opening, large quantities of firm coagula, with masses of chorionic villi, were evacuated from a cavity with surprisingly thick walls. One of the illustrations shows admirably the method of closure of the abdominal ostium described by Bland Sutton.

TABLE XIV.—OPERATIONS.

Colporrhaphy—	
Anterior	7
Posterior	3
Colpoperineorrhaphy	2
Removal of piles	1
„ uterine polypi	12
Fistula, vesico-vaginal	3
Posterior division of cervix	3
Removal of caruncle	4
Cervical polypi, removal of	3
„ cysts, „	1
Perineorrhaphy (Tait's)	44
Trachelorrhaphy—	
Emmet's	35
Schroeder's	4
Ventral cœliotomy—	
Exploratory	3
Ovariotomy	18
Panhysterectomy	6
Salpingo-oöphorectomy	9
Colpotomy	1
Marion Sims' operation for cervical carcinoma	4
Herniotomy	3

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TABLE XV.—HYSTERECTOMY.

No.	Name	Age	DISEASE	Result	REMARKS
1	A. H.	48	Malignant Adenoma .	Cured	Panhysterectomy.
2	M. S.	30	Interstitial Fibroid .	Cured	„ Uterus size of 6 months pregnancy.
3	E. B.	43	Fibroid uterus .	Cured	„ Growth had frequently caused retention of urine.
4	L. B.	25	Fibroid uterus .	Cured	„
5	B. O.	45	Myoma uteri .	Cured	„ Tumour reached above umbilicus.

TABLE XVI.—COLPOTOMY.

No.	Name	Age	Disease	Result	REMARKS
1	J. L. K.	26	Left .	Cured	Vaginal fixation.

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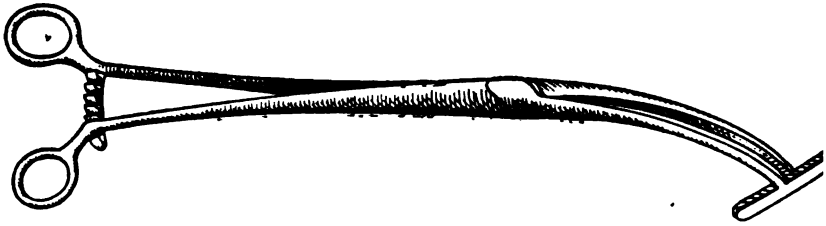
In performing pan-hysterectomy I have derived much help in opening the vaginal fornices from the use of the forceps here figured, passing it well up to stretch the vaginal roof, either anteriorly or posteriorly, as may be found easier.



A. H., the first in the list, had undergone ovariotomy by me several years ago. On that occasion her dread of operation had caused such nervous vomiting and collapse that the procedure was postponed. An antiseptic abdominal pad was constantly applied, and a day fixed without her knowledge, thus taking her by surprise.

In the case of E. B. the enlargement of the uterus was such as to cause its occasional impaction in the pelvis and complete retention of urine. This latter happened so frequently that I advised its removal and performed panhysterectomy. A few hours later the patient's condition was so alarming that I dreaded internal hæmorrhage, and the wound was opened without anæsthesia, as the patient firmly refused to take chloroform. Some blood was found free in the cœlom, chiefly coagulated, which had doubtless come from adhesions which I had separated on the left side. I removed the clots as well as the patient's condition would admit, and having placed a small gauze drain, closed the wound again. Then intravenous transfusion of saline fluid was performed, with marked improvement in her pulse, and ultimately satisfactory convalescence was established.

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TABLE XVII.—SALPINGO-OÖPHORECTOMY.

No.	Name	Age	DISEASE	Result	REMARKS
1	J. S.	36	Double pyosalpinx .	Cured	Drained.
2	M. S.	26	Cystic ovary, left .	Cured	
3	M. E. D.	28	Double .	Cured	
4	T. H.	29	Double .	Cured	Right ovary = large egg, containing large blood cyst.
5	M. K.	32	Left .	Cured	
6	M. K.	29	Double .	Cured	Large tubo-ovarian cysts ; adhesions drained.
7	M. B.	36	Very large pyosalpinx	Cured	Drained by vagina.
8	A. D.	20	Double .	Died	Dense adhesions to rectum ; bowel injured.
9	J. T.	35	Tubal pregnancy and pyosalpinx	Cured	Opened by vagina. See *infra*.
10	K. K.	22	Pyosalpinx .	Cured	Opened into vagina ; drained.
11	A. W.	27	Right cystic .	Cured	Left cystic resected.

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TABLE XVIII.—OVARIOTOMY.

No.	Name	Age	DISEASE	Operation	Result	REMARKS
1	E. J.	27	Intraligamentous cysts	Double	Recovered	Vaginal drainage. See *infra.*
2	C. A.	34	Ovarian cysts .	Left	Recovered	Extensive malignant disease of peritoneum
3	E. F.	23	Dermoid .	Left	Recovered	Uterus lifted out of pelvis by tumour
4	M. M.	43	Multilocular cyst .	Right	Died	Cyst ruptured before operation. Universal peritonitis
5	H.	27	Multilocular cyst .	Right	Recovered	
6	M. B.	33	Very large cyst .	Left	Died	Cyst ruptered before operation
7	H. S.	33	Small cyst .	Left	Recovered	
8	B. S.	47	Unusual-shaped cyst	Right	Recovered	(?)
9	F. M.	44	Papillomatous cyst .	Right	Recovered	
10	K. M.	31	Small cyst .	Right	Recovered	
11	M. M.	46	Dermoid .	Left	Recovered	
12	A. G.	33	Large, smooth cyst .	Right	Recovered	See *infra*
13	J. C.	38	Multilocular .	Right	Recovered	
14	M. M.	43	Multilocular .	Right	Recovered	Nine weeks pregnant.
15	F. G.	30	Multilocular .	Double	Recovered	Parovarian cyst removed at same time
16	B. T.	36	Multilocular .	Right	Recovered	
17	M. C.	60	— .	Right	Recovered	Cyst contained many clots.
18	M. C.	28	Multilocular	—	Recovered	Cyst everywhere adherent; drained through abdominal wound
19	J. S.	36	Small cyst .	Right	Recovered	
20	M. M.	40		Left	Recovered	Numerous pedunculated fibroids present

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OVARIES.

Cystic.—In nineteen instances, most of which were multiparæ, one ovary was found to be cystic, but in no instance did it give rise to symptoms which called for operative interference.

Ovarian Cysts.—Twenty cases underwent operation; two deaths occurred—one from peritonitis, attendant on rupture of the cyst prior to operation, and one from sepsis. In one the tumour was of very unusual shape and conformation (see illustration), and in another where, owing to impaction of the cyst in the pelvis, vaginal drainage became necessary, the cyst wall was smooth, red and thick, closely resembling a gravid uterus. In one case numerous uterine fibroids were also present, but owing to unfavourable conditions, particularly the aspect of the ovarian cyst, the uterus was left untreated.

In case 1 the cysts were of moderate size, but so buried at their base in the pelvis that entire removal was impossible, and vaginal drainage was established. On the seventh day dangerous hæmorrhage took place from a vessel in the edge of vaginal opening which required ligature. This patient died one year afterwards, apparently owing to malignant change in pelvic organs.

In case 3 the pain and tenderness to pressure over the sacrum, and the unusual relations of the cyst to the uterus, which was pushed by it out of the pelvic cavity, led me sometimes to think that a psoas abscess might be present. Retention of urine had been caused by this growth on more than one occasion.

Of case 12 Dr. Earl reports as follows:—"Of three portions examined, two are rather dense fibrous tissue, with some small-celled infiltration; some bands of smooth muscle are also present. The third portion has a fibrous layer next the cyst cavity, but contains further out a tissue of spindle-

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shaped cells, which are no doubt the stroma of the ovary. A few undoubted ova can be made out, and there are other epithelial masses which are probably sections through the membrana granulosa of small Graafian follicles. Situated still further out is a corpus fibrosum. There is no doubt, then, that the cyst is ovarian; and it is most probably one due to dilatation of a Graafian follicle. There is no epithelial lining, but this is doubtless due to changes taking place in its wall, during its increase in size."

Regarding case 8 (the drawing of which shows its very unusual shape) he writes:—"The cyst wall is formed of fibrous connective tissue, which contains in the deeper part numerous cells. It is extremely vascular, and the tissue is infiltrated with blood; there are no muscle fibres present. In the connective tissue there are a few tubular structures embedded, lined by epithelium. The epithelial tubes above alluded to lead to the conclusion that the cyst is a cystadenoma of ovary."

My reports now furnish details of five cases of ovariotomy in which vaginal drainage of the cyst was found necessary. In case 12, just described, convalescence was entirely satisfactory. In two instances the cyst was a dermoid; of these one recovered slowly after vaginal tapping performed in America. When admitted to the Rotunda the openings in vaginal wall admitted a Bozeman catheter, with the aid of which several portions of hair were removed. In the other dermoid case the cyst caused some delay in the patient's delivery, which took place at her home in the country. The bruising attendant on this brought about suppuration in the cyst and much perimetritis, so that the physical signs at the time of her admission were chiefly suggestive of a suppurating hæmatocele. Incision per vaginam gave exit to blood, pus, and portions of hair, with marked diminution in the swelling and general improvement. However, some

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months later, on re-admission, I found a rapidly-growing sarcoma had developed in the pelvis, and the patient soon succumbed. In my Report for 1898 is an account of a very large cyst entirely incorporated with abdominal walls and pelvic organs, which rendered its removal impossible. Combined abdominal and vaginal drainage gave exit to large quantities of pus, and slow recovery from an apparently hopeless condition ensued.

TABLE XIX.—EXPLORATORY LAPAROTOMY.

No.	Name	Age	Disease	Result	Remarks
1	M'G.	—	Uterine fibroid and malignant ovarian cyst	Recovered	Laparotomy
2	N.	—	Malignant abdominal disease and ascites	Recovered	
3	B.	—	Huge malignant tumour	Recovered	
4	M'G.	—	Malignant left ovary	Recovered	
5	K.	—	Huge malignant abdominal tumour, involving stomach	Died	
6	D.	—	Tubercular peritonitis	Recovered	

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Retro-peritoneal Sarcoma.—A remarkable case of this occurred in a girl aged eighteen, in whom the growth had an enormous size, distending the belly from the sternum to the pubes. The urine was loaded with albumen, and there was general œdema. On opening the belly I found the peritoneum freely movable over a large solid mass springing from the connective tissue in front and to the left of the spine, displacing the left kidney outwards. It was found possible, though with considerable hæmorrhage, to shell the mass out and to secure all the bleeding points in the investing peritoneum. The poor girl's condition was wonderfully good for some hours, when she sank rather suddenly without any obvious cause more than shock. The *post-mortem* showed that no further hæmorrhage had occurred.

NEPHRECTOMY.

One case of this is to be recorded with a fatal ending, which was almost inevitable from the conditions present. The left kidney formed a large tumour entirely disorganised by long-continued pyelitis, and in the iliac fossa, on the same side, was a smaller swelling on the point of discharging through the skin; this was found to be an abscess having as its centre the dilated suppurating ureter, the vesical termination of which was completely occluded by chronic inflammatory changes. These had also brought about such changes in the kidney and its environment that its removal was most tedious and difficult, and attended with much bleeding. The patient died of shock some hours subsequently.

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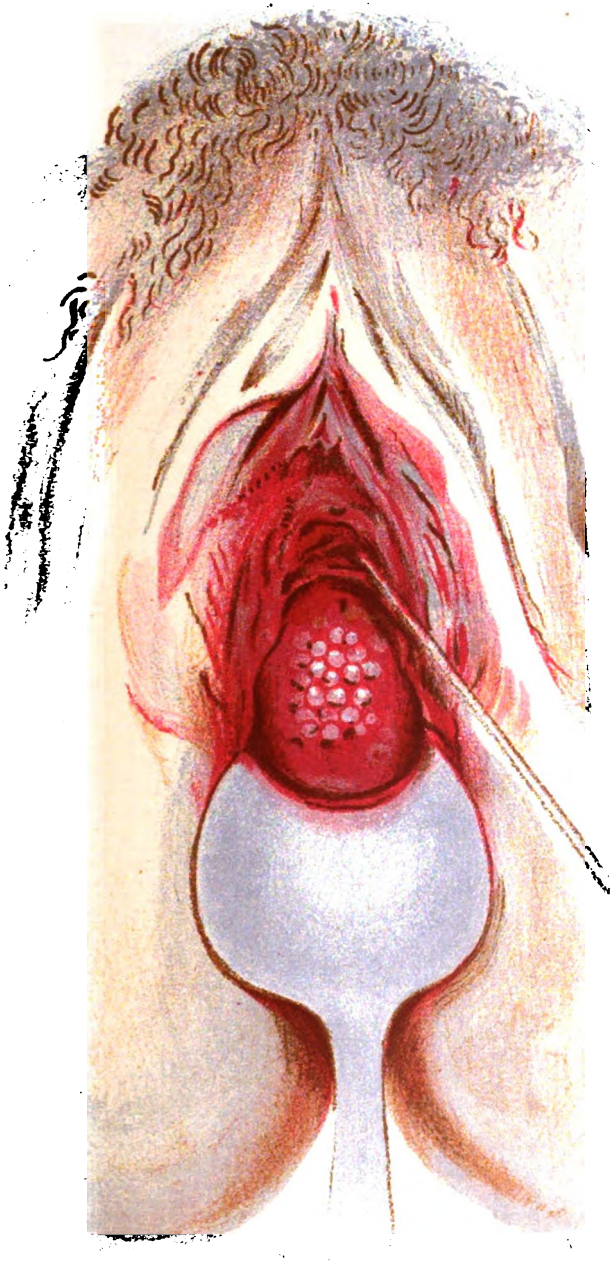

Syphilitic Ulceration of Urethra

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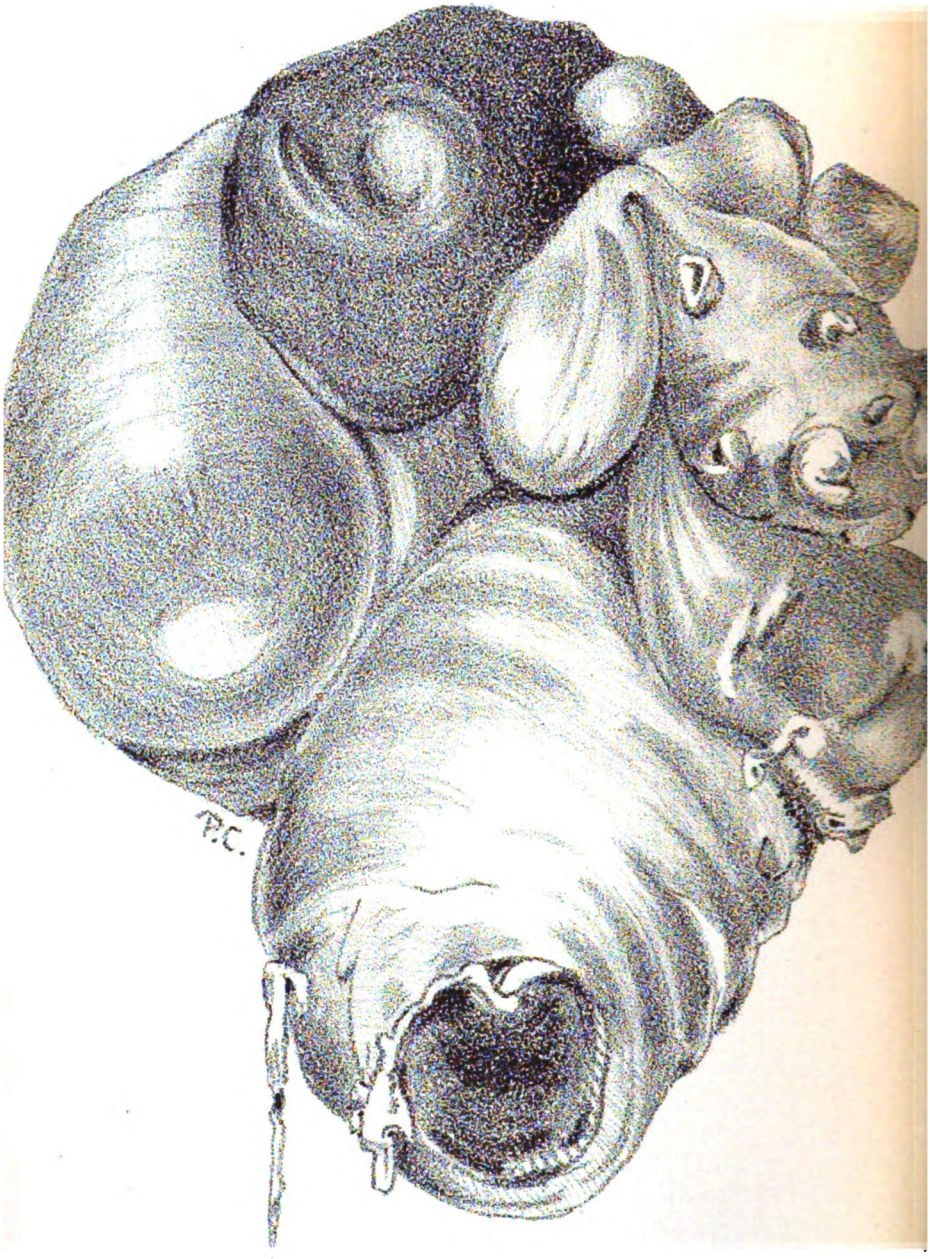

Ovarian Tumour. Case 8. B. S., aged 47.

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Miscellaneous.

No.	Name	Age	Disease or Condition	Result	Remarks
1	R. B.	34	Sinus in labium and vaginal wall, leading to diseased bone, following delivery	Much improved	Pelvis much contracted.
2	B. M.	38	Malignant mass between uterus and bladder	—	Inoperable
3	T. L.	29	Ischio-rectal abscess .	Cured	
4	L. P.	30	Incised wound in vagina .	Cured	
5	J. M.	—	Hæmatometra .	—	
6	L. T.	30	Syphilitic disease of rectum	Improved	
7	L. W.	35	Sinus after ovariotomy, leading to stump	—	Passed ligatures soon afterwards.
8	A. B.	42	Induration about urethral orifice and adjoining parts	Cured	Syphilis?
9	T. L.	36	Umbilical hernia .	Cured	
10	M. D.	68	Prolapsus recti .	Cured	
11	A L.	30	Phlegmasia albadolens, after labour	Cured	
12	T. C.	35	Tertiary syphilis of urethra	Improved	
13	A. K.	36	Pelvic hæmatocele .	Improved	
14	C. O.	38	Hypertrophy of cervix .	Improved	
15	D. K.	29	Vaginal cyst .	Cured	
16	M. J.	—	Cyst adenoma of kidney .	Cured	
17	J. R.	40	Malignant disease of omentum	—	
18	A. M.	37	Extensive malignant abdominal disease	—	Inoperable
19	A. B.	26	Lipoma near left labium .	Cured	

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CYST-ADENOMA OF KIDNEY.

A multipara, aged thirty-six, of very anæmic aspect, was sent from Co. Mayo, with a very large abdominal cystic tumour. On performing cœliotomy I found a large thin-walled cyst extending deeply into the left lumbar region where it was firmly moored. No kidney could be felt at that side. The entire removal of the cyst being impossible, the contents, chiefly clear fluid and some soft material at its deepest part, were evacuated and the sac stitched to the edges of parietal incision. A drain of iodoform gauze was inserted, and a very satisfactory cure was effected. Of this case Dr. Earl writes:—"If this is a renal tumour it is a comparatively rare condition known as papilliferous cyst-adenoma of kidney. It is very like the condition of the same name occurring in the ovary, and my sections do not enable me to say what its origin is. If a renal tumour it is likely to behave as a malignant growth, though there is no cancerous tissue present."

Amongst the miscellaneous cases was one of tertiary syphilis affecting the urethra in its anterior third, and remarkable both for the extent of the ulceration and the deformity resulting from it, which is well shown by the accompanying drawing by my friend, Mr. Williams. On separating the labia, the introitus vaginæ was obscured by the enormously dilated urethral orifice, everywhere showing a red granulating surface, in the midst of which a funnel-shaped canal marked the course of the urethra. It is noteworthy that in spite of this extensive structural change the patient did not suffer from incontinence of urine. In Dr. West's admirable clinical lectures on women's diseases there is a lucid account of some cases, identical with the above-mentioned, which came under his treatment. My patient's history and probable mode of living rendered the

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diagnosis of syphilis highly probable; and her impatience of the restraints of hospital life prevented me from having her sufficiently long under treatment to effect any marked change in her miserable condition.

Dr. W. J. Smyly congratulated the Master of the Rotunda and his assistants upon the excellence of their Report, which was creditable, not only on account of the brilliant results obtained, but also for the manner in which the work had been recorded. He, however, deplored the classification of abortions as preventable and inevitable, for no human being could tell whether a case belonged to one or other group until it was too late to be of any use, and the absurdity of this classification was demonstrated in this Report by the statement that out of a large number of abortions which actually occurred only eight were inevitable. He further objected to the term "induction of abortion" being applied to cases in which sea-tangle tents and tampons were introduced on account of hæmorrhage. In such cases the ovum was already partly detached, and this measure only accelerated a process already begun. Induction of abortion was a very serious procedure, only to be undertaken on the most serious grounds, and after consultation. As regarded myomata in pregnancy and labour, they seldom gave rise to trouble. In one case, however, he had great difficulty in extracting the child; in another he had performed panhysterectomy, with a favourable result to both mother and child; and in a third case the patient died from *post-partum* hæmorrhage, due to a sub-mucous myoma. After delivery he had in a few cases seen retention of the membranes, and in two of these severe sapræmic intoxication. With regard to rupture of the uterus, he had had good results with iodoform gauze drainage, and had from operative measures, but in a paper recently published by Dr. Klein, of Dresden, with a careful analysis of 381 cases, it appeared that the results were about the same, the mortality after operation being 44 per cent., whilst in those drained, tamponed, or douched, it was 39 per cent. There was also little difference between those cases in which a primary cœliotomy was performed and those in which it was performed secondarily, after the delivery of the fœtus, the mortality following the former being 44 per cent., after the latter, 46 per cent. The results were influenced much more by the time that elapsed after

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rupture before the operation was performed, and whether the patient was in the meantime removed to hospital. The mortality in cases operated upon within two hours was only 30 per cent.; later than that, 48 per cent.; half a day or more, 72 per cent. Of cases operated upon either at home or in hospital within two hours, and without transport, the mortality was 16 per cent.; operation, under similar conditions, later than two hours, 42 per cent.; patients operated upon within two hours after transport, 37 per cent. Of cases treated without operation, washing out only, mortality 45 per cent.; drainage with rubber tubes, 17 per cent.; with gauze, 52 per cent. Plugging with gauze gave rather better results. The bad results from gauze drainage he attributed to hæmorrhage; therefore, he says away with the gauze. His conclusion is that in cases of severe hæmorrhage early operation is indicated; in all others, drainage with a rubber tube. The operation should be performed wherever the accident occurred, and the patient should not be transferred to a hospital.

Dr. Jellett said there was a great deal to be said on the question of terminology in all the different forms of hæmorrhage. This was forcibly exemplified in the Report by the number of additional cases of accidental hæmorrhage and of placenta prævia brought in by incorrect terminology. In last year's Report there were altogether 84 cases, but this year they amounted to 167, 116 being *post-partum* hæmorrhage, as against 43 for last year. In the table of cases of contracted pelvis, in a considerable number labour came on at 5½, 6½, and 7 months; but, except in three cases, there was no mention of what brought on labour. There was a great want of commingling of statistics from the various maternity hospitals in Dublin to enable practical data to be drawn from cases. As to uterine myomata, Dr. Horne had some cases occurring in situations where one would think they rendered delivery impossible, yet they slipped up, and delivery was normal.

Dr. Lane said the curette seemed to have been used more frequently in cases of abortion than formerly. Of the 258 extern cases 126 were curetted, but the 43 intern cases of incomplete abortion were all curetted. He was anxious to know why the curette was so freely used since they were all aware that the uterus was not in the best condition for curetting after abortion.

Dr. Smith said case No. 1 in the Extern Maternity conveyed no information to him. He would expect a microscopic examination in such a case. In a case of contracted pelvis the child was

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born alive at 5½ months. Why was labour induced in that case, especially as, with a worse pelvis, a child was born alive at 9½ months? He had the same objection as Dr. Smyly to the term mixed accidental hæmorrhage. He knew many cases of fibroid tumours occurring in pregnancy, and which gave no trouble. He could recollect only one case in which it was necessary to put on forceps to push the tumour out of the way.

Dr. Glenn thought the Report could be very greatly improved. It was full of both typographical and grammatical errors. The cases generally were very incomplete. In case 3, page 178, they did not mention how far the patient had gone in pregnancy. Case 4, page 179, was most interesting, but there was no diagnosis. In several cases there was no mention of the fœtal heart. In Table IV. there was mention of 13 cases of version—there were several kinds of version, and all through the Report he had looked to see if there was any attempt first made of external version, but could see none. He noticed they had gone back to the old term, "transverse," instead of "oblique" presentation. As to the remarks of previous speakers on the cases of contracted pelvis, he believed, speaking from personal experience, that it took the assistants a considerable time to become adept in the use of Skutsch's pelvimeter, and, meantime, their measurements were not above reproach. In the Table of Contracted Pelvis there were a great many blanks. This should not be, and certainly would not be found in any German report. In a case of eclampsia the urine was stated to be "loaded with albumen." The actual amount should have been measured and noted. In a case of scarlatiniform erythema it was not stated whether the morphin might not have caused it. There was no record kept of the amount of blood lost in cases of accidental hæmorrhage, placenta prævia, or *post-partum* hæmorrhage. This should be done by weighing diapers and sheets in the hospital. Again it was stated "three patients who had no hæmorrhage on the couch lost a considerable amount on being put to bed." His explanation of that was the fussiness of sisters and lady superintendents in their anxiety to have the labour ward ready for the next case. He thought it would be a great improvement if, as in the London hospitals, the report was entrusted to a medical or surgical registrar accustomed to the work year after year. Such a man would produce a more scientific report, and could also do some original work, which was badly wanted in Dublin, where a large amount of valuable material was wasted.

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What Assistant had ever investigated the bacteriology of the vagina? Not one, because there was no proper laboratory, and both the Master and Assistants had too much other work to perform. He made these remarks in no cavilling spirit, but with the best interests of the hospital at heart.

Dr. A. V. Macan said the information given by Dr. Smyly as to the treatment of ruptured uterus was most valuable and interesting. The idea he (Dr. Macan) had was that in all cases where the child had gone into the abdomen the operation by abdominal section should be performed. It was easy to say that in a clinique, but men in practice wanted to know an alternative treatment. Drainage was within the reach of every man in the country, and if it were confirmed by further observations that it gave a smaller mortality it would be an enormous improvement. In case 1, page 14, of hysterectomy and ruptured uterus, the woman got a ruptured uterus when apparently only about 7 hours in labour. That was very exceptional. He thought fibromata had not very much effect on labour, and how far they interfered with conception was questionable. Their position was more important than their size, all tumours above the contraction ring going up exactly as the bladder was pulled up. As to the occurrence of hæmorrhage when the placenta was inserted on the portion corresponding to a fibrous tumour, he thought it was impossible for that portion of the uterine wall to contract, and, therefore, the vessels should remain open, and lead to *post-partum* hæmorrhage. He agreed with Dr. Glenn that the Report contained some extraordinary mistakes. It seemed to be the routine treatment to curette all cases where the temperature went up in the puerperal state, but he did not think it right. He thought 29 cases of manual removal of the placenta a large number. There seemed to be a great many cases of *post-partum* hæmorrhage. It was stated that "some cases of secondary *post-partum* hæmorrhage were due to retained membranes, and yielded to suitable treatment." It was many years since he (Dr. Macan) came to the conclusion that retained membranes could not cause hæmorrhage. In cases of badly contracted uterus both hæmorrhage and retention of membranes occurred, and in removing the latter the insertion of the hand made the uterus contract, and stopped the hæmorrhage. As to the case of Cæsarean section, the woman was supposed to be 1½ months from the end of her pregnancy, and it was possible for the child to go through at full term. He would say the brow presented because it was a flattened pelvis and the

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head was going through by the ordinary mechanism. It seemed to him that Cæsarean section in a first case under these conditions required some justification. There was no correspondence between the different stages of morbidity—the first was from 98·6° to 100·8° = 2·2°; the second from 100·8° to 101·2° = ·4°, yet it was made into a whole class; the third from 101·2° to 102·2° = 1°; and the fourth, 102·2° to 104° = 1·8°.

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HYSTERECTOMY BY DOYEN'S METHODS.

By W. J. SMYLY, M.D., F.R.C.P.I.;
Ex-Master, Rotunda Hospital;
Gynæcologist to the Adelaide Hospital, Dublin.

[Read in the Section of Obsterics, April 19, 1901.]

The question as to which is the best method of operation for the removal of the myomatous uterus still remains open to discussion. The majority of operators in these countries have adopted the sub- or retro-peritoneal treatment of the cervical stump left after supravaginal amputation of the uterus. I have, however, for several years practised, and still prefer, complete hysterectomy, chiefly because the cervix is of no use whatever to the patient after the rest of the uterus has been removed, and is, on the contrary, a distinct source of danger, for although the two chief causes of mortality in these cases—namely, sepsis and hæmorrhage—have been almost entirely eliminated, yet cases are still, from time to time, reported where the stump has either sphacelated in consequence of being deprived of its arterial supply, or has undergone malignant degeneration, and this is most likely to occur in cases in which a nodular sarcoma has been mistaken for myoma. I therefore prefer to remove the entire uterus, and having tried several methods introduced with this object I have no hesitation in pronouncing M. Doyen's to be the best.

In 1894 I adopted his vaginal method, and in a paper read before the British Medical Association at the Edinburgh meeting, I recorded seventeen cases treated in this

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way with one death. I have now five more cases to add to the number, making twenty-two cases with one death, or a mortality of 4½ per cent.

The vaginal method is only advisable in the case of small tumours which can be drawn downwards into the pelvis. In one of my cases, however, operated upon in 1895, the fragments weighed 5 lbs., but I shall never again attack so large a tumour *per vaginam*.

Before recording the cases I may as well briefly describe the *modus operandi*. The vagina having been thoroughly disinfected, and in some cases dilated either by plugging or by a colpeurrynter, the cervix is brought into view by a speculum, and is seized by volsella and drawn upwards and forwards towards the pubes. The posterior fornix is incised, and if possible Douglas' pouch freely opened. The cervix is now drawn downwards and backwards towards the perineum, and the mucous membrane divided across its anterior aspect, uniting the ends of the posterior incision; the bladder is pushed up as far as possible and protected by a retractor. Then the anterior wall of the uterus is divided with scissors up to the retractor, and two Museux forceps applied to the divided cervix as high up as possible; traction upon these brings the uterus further down, and the bladder having been pushed further up the incision is prolonged, and two more forceps applied. As soon as the peritoneal cavity is opened and enlarged transversely, the retractor is pushed into it, and the bladder and ureters are lifted up by it out of harm's way. The incision is then carried upwards through the anterior wall and more forceps applied, until at last the entire organ is drawn outside the vulva. But it is seldom possible to do this with a single incision. As a rule it will soon be found that the organ will not descend further with traction, and that the central incision

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cannot be carried further up; it then becomes necessary to diminish its bulk by morcellation. This is accomplished by making two lateral incisions in the direction of the cornua of the uterus and cutting away the tissue included between them. The uterus now comes lower down and the process is repeated, and any myomatous nodules met with are removed, if necessary, by morcellation. At last the uterus comes out and the broad ligaments are secured and divided. M. Doyen does this by first crushing the tissues with an angiotribe, and then ligaturing them, but I have never used this instrument in vaginal cases, not feeling satisfied as to its value. I have generally used clamps, and in a few cases ligatures. The mass having been removed, the field of operation is cleansed, a long strip of gauze carried up into the wound, the clamps carefully surrounded with gauze to protect the vagina, the bladder emptied, and the patient put to bed, with a small cushion so placed as to support the clamps and prevent injurious pressure.

I shall now briefly refer to the five additional cases which have not been previously recorded.

Case I.—A. P., aged forty-two, unmarried. Admitted to the Adelaide Hospital, September 1st, 1898. I had previously removed a fibrous polypus from this patient in the Rotunda Hospital. The uterus was now as large as a fœtal head, and the sound penetrated 4½ inches. She had recently suffered from profuse hæmorrhages, which rendered interference necessary. I dilated and explored the uterus, but found nothing removable. On October 11th I removed the organ *per vaginam*, and she made a complete recovery.

Case II.—M. C., aged forty-three, married, two children, the last pregnancy nine years previously. She suffered from acute pain and hæmorrhage. The uterus was removed on January 7th, 1899, and the ligaments clamped. It was the size of a cocoanut. She was discharged well on the 28th.

Case III.—F. P., aged thirty-five, unmarried, uterus as large as a

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fœtal head, profuse hæmorrhages, uterus removed January 5th, 1899, ligaments clamped. Discharged well, January 24th.

Case IV.—F., married, mother of two children, was admitted to a private hospital, January 8th, 1899. The myomatous uterus reached nearly to the umbilicus, and she had been reduced to a condition of profound anæmia by frequent and profuse floodings. The uterus was removed *per vaginam*, but convalescence was delayed by phlegmasia of one leg, and she did not leave the hospital until March 27th. Since then she has suffered from severe pelvic pain, and I fear a second operation will be required.

Case V.—Miss D. A. was admitted to a private hospital on November 24th, 1900. She had a myomatous uterus about as large as a fœtal head, but she had been reduced to such a state of profound anæmia that I deferred operating until December 2nd, endeavouring in the meantime to limit the hæmorrhage and restore her strength. The operation was a simple one and recovery uninterrupted.

ABDOMINAL METHOD.

First step: Incision through anterior abdominal wall, and extraction of the tumour over the pubes.—The patient having been placed in the Trendelenburg position, an incision is made from the pubes towards the umbilicus as far as is considered necessary. The peritoneum having been opened, a sterilised gauze compress is placed above the tumour to protect the intestines. The tumour is then perforated by a corkscrew, and pulled up over the pubes, a second corkscrew is then placed on the posterior aspect, and the intestines are thoroughly protected by compresses.

Second step: Extirpation of uterus and hæmostasis of its pelvic attachments.—The posterior vaginal fornix is opened, and, in case of difficulty, a curved forceps introduced through the vagina and firmly pressed upwards by an assistant will render this more easy. The finger introduced through this aperture finds the cervix, which is drawn through it by a special instrument or a Museux forceps and lifted up. The lateral attachments, which

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are easily recognised by the left index finger, are divided at both sides by scissors, the cervix drawn further up, and the anterior fornix coming into view the anterior vaginal attachments are divided close to the cervix, and as the bladder is separated by the finger the entire cervix is drawn upwards The left index finger passed under the right broad ligament, and through the anterior peritoneal attachment, is drawn upwards, separating the ligament from the uterine wall. It is then secured by clamps and divided. The tumour is then turned over to the left and the ligament on that side clamped and divided. The clamps are now replaced by ligatures. Doyen crushes the tissues before ligaturing them, but I have done this in one case only, and am not convinced of its value. I show you, however, the angiotribe used.

The field of operation is then cleansed and any bleeding points secured.

Third stage: Closure of pelvic floor.

Fourth stage: Closure of abdominal wall.

In some cases the broad ligaments do not permit of the tumour being drawn up over the pubes; they are then secured by two clamps on either side and divided. The uterus is now easily drawn up. If the uterine artery be torn or divided in freeing the cervix it is immediately seized and ligatured. If there be difficulty in getting at Douglas' pouch it may be necessary to separate adhesions, or to enucleate tumours to do so; and if this is not practicable, the vagina can be opened at the side or in front.

ABDOMINAL HYSTERECTOMIES.

Case I.—A. C., aged forty-two, unmarried. Tumour as large as adult head. Indications for operation, pain and hæmorrhage. Operation, May 27th, 1899. From commencement of abdominal incision until uterus was drawn out over pubes occupied five minutes,

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removal of uterus six minutes, securing pedicles and closing pelvic wound seventeen minutes, closing abdominal wound ten minutes, entire operation, forty minutes.

Case II.—C. S., aged forty-four, unmarried. The tumour reached nearly to the ensiform cartilage, and was as large as an eight months' pregnancy. Indications for operation, continued growth and pain. The uterus was out in twenty minutes, but the subsequent treatment of the pedicles and closure of the pelvic wound occupied forty minutes, and the closing of the abdominal wound fifteen. This was the longest and bloodiest case of the series. She made a good recovery.

Case III.—P. G., aged thirty, married, no family, abortion ten years before. The uterus was displaced forwards by a large tumour, which occupied the back of the pelvis and extended from the umbilicus above to the level of the sacro-coccygeal joint below. She complained of severe hæmorrhage and vesical irritation. Operation, October 7th, 1899. The tumour when exposed was found to have developed extra-peritoneally, so that it could not be drawn upwards out of the pelvis. I therefore reversed the proceeding, first opening the anterior fornix; then passed the forefinger of my left hand along the side of the cervix, burrowing between it and the uterine vessels, and thrust it out through the posterior layer of the right broad ligament. Having worked it upwards for about an inch or more, I clamped and divided the ligament. Having done the same on the opposite side I easily enucleated the tumour from the cellular tissue. The entire operation occupied fifty minutes.

Case IV.—A. J., unmarried, aged forty-seven; indications, severe abdominal pain with frequent retching and vomiting; tumour up to umbilicus; weighed 9½ lbs. Operation, July, 1900. Good recovery.

Case V.—Mrs. C. was under observation for six years. In 1899 I found that the uterus had grown considerably, reaching to midway between the umbilicus and ensiform cartilage, and I advised its removal. The operation was performed on November 28th, 1899, and presented no difficulties. She rallied well from the anæsthetic, but vomiting was unusually severe and she was very restless. Her epigastrium was distended in the evening, but otherwise she seemed well. Next day her abdomen was distended

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and the sickness continued. A purgative was given in the middle of the day, and an enema at night, which brought away a large quantity of flatus and fæcal motion. On the third day, however, she was much more disturbed, and had passed no flatus since the night before. An enema was administered but did not return. Another enema, administered by myself with a long tube had no better result, and I then found that some moisture had come through the binder. When the dressings were removed I found that the catgut sutures had given way and a piece of small intestine was protruding. She was chloroformed and the remaining silkworm-gut sutures removed. The intestine at once protruded, but no cause for the obstruction could be discovered. In order to replace the intestines, and close the abdomen, I was obliged to open and drain them in two places. She did not rally from this second operation, but died in three hours. I have no explanation to offer for this ileus. The distension commenced at the stomach and extended to the small and large intestines. Whether it was a case of primary paralysis I cannot say, but the condition of the patient, her temperature, and especially her pulse, which up to the time of the second operation never rose above 70 beats per minute, and the appearances of the wound and peritoneum, appeared to us to exclude any idea of septic infection.

Case VI.—Mrs. H., married ten years, no child. Had suffered from dysmenorrhœa, which was much relieved in London by division of the cervix and electricity. When I first saw her in 1897 the tumour reached half way to umbilicus. In 1899, however, it increased so rapidly that in the beginning of April it was two fingers' breadth above it. I removed the uterus on April 27th, and she made a good recovery.

Case VII.—L. R., aged forty-five, suffering from severe hæmorrhage and vesical irritation. The uterus was the size of a fœtal head. I removed it on October 18th, 1900. Recovery uneventful.

Case VIII.—Mrs. W., widow, five children. Last pregnancy sixteen years before. Was reduced to a very anæmic condition by profuse hæmorrhages. Operation, December 15th, 1900. Recovery complete.

Case IX.—Mrs. O. When I first saw this patient her uterus reached within two inches of umbilicus. When I saw her again

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some months later it was an inch above it. Up to first visit she had had no symptoms, and the tumour was accidentally discovered by her physician. Latterly, however, she had suffered much pain and discomfort. Operation was performed January 14th, 1901. She made an excellent recovery.

Case X.—Miss R., aged sixty, complained of bearing down of womb. The last few months especially she suffered from frequent and painful micturition. She could not wear a pessary because it hurt her. The uterus was about the size of a fist, and retroverted, both vaginal walls protruding. Operation, January 29th, 1901. The uterus was removed in fourteen minutes. I adopted the abdominal route because of the prolapse. Recovery complete.

The impression left upon my mind by these operations is that Doyen's operations are the best methods as yet devised for removing the myomatous uterus, and my inclination at present is to perform the abdominal more, and the vaginal less, frequently. The great advantages of this over other abdominal methods are facility and rapidity of performance. The entire uterus is removed: the vagina is not shortened, and but a small opening is, as a rule, made into it. I have no doubt that my present mortality (10 per cent.) is much higher than I may reasonably expect as a future average from this method.

I wish to correct an error which occurred in reporting the first specimen obtained in this way by me, and which was reported as the first in Ireland. Dr. Lentaigne had, however, performed the operation before that time.

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A CASE OF SARCOMA VULVÆ.

By T. HENRY WILSON, F.R.C.P.I.;
Gynæcologist to the Richmond Hospital;
Ex-Assistant-Master, Rotunda Hospital, Dublin.

[Read in the Section of Obstetrics, May 24, 1901.]

The case I wish to bring under notice is one of sarcoma of the vulva. Sarcoma attacking the genital organs is of comparative rarity—at any rate as a primary growth; but sarcoma of the vulva is very much less frequent than that of the vagina.

There is little information on the subject to be obtained from text-books; it seems that most authors agree that the disease is rare, that the most usual variety of the disease found is the melanotic or the spindle-celled, and that it is a disease of old age, occurring between sixty and seventy.

The glands are said to be affected early, and it is generally stated to recur after operation, and to end in a fatal result within a short time. Dudley reports a case, however, in which he operated for sarcoma (spindle-celled) of the mons veneris, and in which there was no recurrence after fifteen years.

Winter mentions that sarcoma occurs either as a large round tumour or in the form of warts which may be of the melanotic variety.

The following case came under my care in the Richmond Hospital in July, 1900:—

Case.—Patient, aged thirty-four, not married, complained of "falling of the womb." She stated that the womb has been completely outside for the last ten months, and that it had been

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ulcerated, but was now healed. I found a smooth tumour, about the size of a large hen's egg, growing from the fossa navicularis; it was covered with mucous membrane and was hard and inelastic. On the most dependent surface was a bright red patch as large as a shilling, and resembling a cervical erosion. It did not bleed. The tumour sprang from a base about 1½ inches long and 1 inch wide. I believed it to be a myoma, and excised it by making two elliptical incisions deep into the perinæal body. The wound was closed by three silkworm-gut sutures passed through the whole depth.

Dr. Earl, Pathologist to the Richmond Hospital, kindly examined the specimen microscopically, and states it is a spindle-celled sarcoma.

I examined the patient about the middle of the present month, and found a small tumour, about as big as two peas, on the posterior vaginal wall, just inside the hymen. I do not remember seeing it when I operated on her, but I will keep her under observation. I could detect no enlargement of glands in the pelvis, and the inguinal glands were not enlarged.

On looking up the literature of the subject, I was surprised to see how little was to be found, and how few cases had been reported. I, therefore, think that the rarity of the condition justifies me in recording this case.

Dr. Jellett said he did not gather whether the tumour was entirely below the hymen or not. A few days ago he was shown a microscopic section of a small round-celled sarcoma of the forearm, which formed a tumour very closely resembling the present case, and which was removed under the idea that it was a small fibrous tumour of the skin.

Dr. Macan asked whether Dr. Wilson thought the small growth might not have been there when he operated originally?

Dr. E. H. Tweedy said the case emphasised the necessity for sending almost every tumour one met with to a microscopist. The tumour looked uncommonly like a fibroid, and he would like to

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know what reason Dr. Wilson had for getting it examined. Was it his routine practice to have every tumour examined, or was there anything that roused his suspicion?

Dr. Wilson, in reply, said it was not his practice to have every tumour examined microscopically, but he had never known of a myoma in that region, and he wanted to make sure it was a myoma. The diagnosis was amended by the pathologist, and consequently the patient was told that she should be examined occasionally, as the tumour might recur. The tumour was altogether outside the hymen.

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SECTION OF PATHOLOGY.

BACTERIOLOGY OF AN ABSCESS UNDER THE SCALP.

[Read in the Section of Pathology, Friday, November 2, 1900.]

DR. A. C. O'SULLIVAN gave particulars of the bacteriology of a case of abscess involving the frontal, parietal, and temporal bones. He isolated from the pus the *Streptococcus pyogenes* and the *Staphylococcus pyogenes albus* and *aureus*. The *streptococcus* proved very virulent, 1 c.c. of a broth culture, injected intra-peritoneally into a rabbit and subcutaneously into a guinea-pig about 2 p.m., causing death during the same night. Neither variety of the *staphylococcus* produced any effect when inoculated into guinea-pigs or mice.

PROFESSOR BENNETT said that some details of this case during life might prove of interest. He saw the child a year and a half ago, and he was remarkable as being an illustration of what was not commonly seen, and that was a combination of tuberculosis with rickets. Long ago, in 1858, or thereabouts, Sir Wm. Jenner wrote the best account of these diatheses, as he called them, and one of the strong points of his description was the rarity of tuberculosis and rickets crossing each other. This child had rickets without doubt, his femora and shin bones bearing evidence of it. He was six or seven years old when there supervened on the rickets tuberculosis, which attacked him in many places. Over the temporal fossa of his left side was an abscess like the other tubercular ones all over his body. He developed the symptoms of ordinary tubercular meningitis of children, and the question then arose whether he should not expose the suppurating centre in the temporal fossa, in which a dead bone, undetached, could be felt, and whether he should not open the skull. Had he opened it he

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would have found nothing but a little piece of bone which contained no tubercle. He would have probably hastened the death, and it would have been an unsurgical proceeding.

Professor McWeeney said it was an interesting thing to find all the various pus-cocci in the one specimen. It would have been interesting, in view of the development of general tuberculosis, if one of the guinea-pigs had been directly inoculated from the pus, and not from one of the cultivations, because it was well known how very difficult it was to detect tubercle bacilli in specimens of exudation, pleural, peritoneal, or meningeal, by the microscope alone. He had come to the conclusion that in suspected tubercular cases the only final test was inoculation. He was going to ask whether the death of the inoculated animals might not have been ascribed to toxæmia rather than the septicæmia, but this was answered later when Professor O'Sullivan said he attributed the death of one of them to toxæmia. The only streptococcus which was able to kill animals in the short time mentioned was that of Marmorek, which was heightened in intensity by growth in ascites-bouillon as well as by repeated animal passages.

Dr. Knott remarked that tubercular meningitis occurring at that age was rather a local affection as contrasted with the tubercular meningitis they found in young adults.

The President (Professor O'Sullivan), in reply, said he agreed that inoculation was often the only way to determine positively the presence of tubercle, but in this case if he had inoculated the guinea-pig with this pus the streptococci would have killed it long before the tubercle bacilli could have acted. The pus was not like that of a cold abscess where the cells had completely degenerated, but was quite fresh.

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A CASE OF APHASIA.

By H. T. BEWLEY, M.D.;
Physician to the Adelaide Hospital, Dublin.

[Read in the Section of Pathology, November 2, 1900.]

A FEW details about a case of aphasia, taken together with the *post-mortem* appearances in the brain, may be of interest.

CASE.—Mrs. H. was a healthy woman, aged thirty-three, had nine children and three miscarriages. No history of syphilis. Used to take at least two bottles of porter daily.

On the 12th of May, 1897, she suddenly became unconscious. I have no details of the seizure. She remained in an unconscious or semi-conscious state till she was brought into hospital on May 21st.

On admission she was in a very dull, stupid condition, unable to speak, and apparently unable to think. There was slight paralysis of the right half of her face, but except for this there were no motor or sensory symptoms, except such as were accounted for by the unconsciousness. She gradually recovered consciousness, and became able in a couple of weeks to walk about, dress and feed herself, &c., and subsequently completely recovered consciousness. She did not, however, recover her power of speech.

By May 29th—seventeen days after the onset of the attack—she said "yes" and "no" indiscriminately to questions; also many grunting sounds, not words. If asked what a letter of the alphabet is, names them wrongly—"A" may be "E" or "F" or "N" or "C." She could copy writing, but did not understand what it meant. If a written request is made to her (to raise her arm) she does not do it; neither does she obey verbal requests.

On June 3rd she had a larger number of words at command, and knew she was making mistakes in what she tried to say.

By June 11th she was able to understand verbal requests; and, in reply, would say two or three words of the beginning of a sentence, but her words would then come to an end, and with some inarti-

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culate sound she would often end in a burst of laughter or a gesture of annoyance. In this state she remained till she left hospital on June 26th—six weeks after the attack commenced.

She remained at home till the following January, when, on the 15th, she was re-admitted suffering from phthisis. This disease rapidly progressed, and she died on February 15th, 1898.

During this stay in hospital the state of her speech-faculty was as follows:—1. She could recognise objects and knew their uses; there was no mind-blindness. 2. Although she knows the uses and natures of things seen, tasted, &c., she cannot recall their names. 3. Understands simple sentences spoken to her—*e.g.*, holds up her hands when told to do so. 4. Cannot understand printing or writing; can read words, but her mind does not take them in. She read with difficulty the words "Hold up your hand," but did not seem to have any idea of doing it. Reads "What is your husband's name?" but the words seem to bring no idea to her. Reads with difficulty and makes mistakes in words, reading very slowly. 5. She can recognise tunes. When some singing was going on in the ward, she pointed out to a nurse in a copy of the words the line that was being sung. 6. She has very little voluntary speech, uses very few words in answering questions, and makes many inarticulate sounds. She can utter words in a sentence, but if asked deliberately to speak the word she is unable. If asked "How are you?" she says "Pretty well," but if I say "Now, say 'pretty well,'" she cannot. Is quite conscious of the mistakes she makes; communicates with the nurses mostly by signs. 7. She can copy words, though badly, but cannot write correctly except her own name. Told to write "I think," wrote "I have been," and again told to write "I don't know," wrote "I have been." She makes mistakes with figures; told to write 57, wrote 108; but when 41 and 27 were written down, and she was told to add them together, she wrote down correctly 68.

At the *post-mortem* examination we noticed, when the brain was removed, that the region of Broca's convolution and its immediate vicinity was depressed. The brain was hardened in formalin, and cut into transverse sections. These show that the brain affection was caused by a hæmorrhage, which took place in the neighbourhood of the island of Reil on the left side. As a result of this the gray matter of the convolutions of the insula, and of the convolutions that bound the insula above and below, was destroyed; in

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its place is seen a quantity of a yellow substance which, on microscopic examination, is found to consist largely of yellow granules—I presume of hæmatoidin. The white substance is also destroyed to some extent.

Dr. Dawson remarked that the case was one in which there was a complicated lesion, and the lesion could not have been very complete in any part, as there appeared to be a certain degree of word deafness and a considerable degree of word blindness. With regard to speech and writing, the difficulty seemed to be with the sight element of speech. It was interesting to note that the island of Reil was fixed upon by Flechsig as his association-centre—a centre in connection with that of hearing, of the motor organs of speech, and various other centres. If this view were correct the physical element of speech would be damaged in the case of a lesion of this kind. He inquired whether Dr. Bewley located the hæmorrhages as intra-cortical or over the surface.

Dr. Bewley, replying, said that with regard to the seat of the hæmorrhage, he was inclined to think that it was in the space bounded by the convolutions and the island of Reil.

Dr. A. C. O'Sullivan, however, was of opinion that it was an intra-cortical hæmorrhage.

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EXHIBIT.

[Exhibited in the Section of Pathology, Friday, November 2, 1900.]

Dr. H. T. Bewley exhibited a heart, the subject of mitral narrowing and aortic regurgitation. It was taken from the body of a girl aged twenty, who, while apparently in perfect health, and without having complained of any symptom of disease, suddenly fell down dead while walking across a yard. At the autopsy the heart was found moderately full of blood; none of the cavities were over full; the blood was unusually fluid. The mitral orifice is extremely narrow, not admitting the tip of the finger; the left auricle is dilated, and its wall greatly hypertrophied; the aortic cusps are thickened and contracted; the left ventricle is slightly hypertrophied; the muscle of the heart, the coronary arteries, and the right side of the heart are normal. All the other organs of the body are healthy.

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BACILLUS AEROGENES CAPSULATUS.

By E. J. McWEENEY, M.A., M.D., D.P.H.

[Read in the Section of Pathology, November 30, 1900.]

THE case from which this organism had been isolated was that of a man whose arm had been ground almost to a pulp through being caught in a threshing machine. He was sent up by train to the Mater Hospital with a tourniquet on the arm, and did not long survive amputation. At the operation a peculiar gelatinous state of the tissues was noted. The day following death the body presented a remarkable appearance, being swollen to twice its size, covered with huge bullæ, nearly black in colour, and crepitant wherever touched. The skin was so softened that a blunt pair of forceps could be thrust through it with perfect ease, and from the apertures so made a frothy fluid, made up of turbid serum and sour-smelling gas, issued forth. The microscope revealed large anthrax-like bacilli in enormous numbers, mingled near the operation wound with smaller forms. By means of anaërobic plate cultures, made over alkaline pyrogallol in a special dish (now exhibited), isolation of the large bacillus was accomplished, though not without difficulty. It was associated with *B. coli* and a streptococcus, both of which grew quite well in the total absence of free O. The gas-forming bacillus was quite as large as anthrax, stained well by Gram, was non-motile, devoid of spores, and possessed a thick capsule, which usually remained unstained. It appeared to grow most luxuriantly in 1 per cent. sodium-sulphindigotate-agar, the medium becoming decolorised, save the upper centimetre, where the oxygen necessary for

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the pigmentation was supplied by the atmosphere. It also grew well on ordinary media in an atmosphere of H., but not in coal-gas. Rabbits killed shortly after intra-venous injection with half a c.c. of suspension became distended with gas. The heart and vessels contained frothy blood, and the liver was converted into a soft, dark grey mass, riddled with cavities containing gas. A specimen of such a liver—the *Schaumleber* of German *post-mortem* rooms—was now exhibited. A rabbit which was injected intra-muscularly with the pure culture got a spreading gangrenous process, but this was found at the autopsy to be due to a mixed infection. Exhibitor had not as yet experimented with guinea-pigs. He now demonstrated a preparation from the gangrenous tissue of the rabbit, showing the large gas-bacilli stained by Gram, whilst the symbiotic intrusive organism was counter-stained red with fuchsin. Contact preparations from anaërobic plate cultures showed a marked tendency of the bacilli to form angles like a capital V. The speaker concluded by pointing out that, though the condition in the present case only came on *post-mortem*, the bacillus had been proved by Welch, Flexner, and Nuttall to cause a spreading emphysematous gangrene in the living subject, and had also been found in various other conditions associated with development of gas during life or immediately after death.

Prof. A. White said he had been looking for this organism for some time, but saw it first in cultivation that night. He had obtained some internal organs which had been acted on by this organism. About two years ago he got a piece of liver which he thought probably was affected with this organism, and on examination he found that there was a large bacillus present in large numbers, the liver being full of holes, and the organisms round these holes. He saw only the *post-mortem* appearances, but there was no sign of emphysema during life, and the patient had died of

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ordinary pneumonia. He had sent to him from Africa several organs from a case of black-water fever, and the sender thought that the peculiar condition of the organs, which were full of holes, was peculiar to the fever. On examination he found also a large bacillus present in great numbers, and, though he had made no cultures, he believed it to be the same as that under discussion, as it had the same staining characteristics. In the paper of Welch and Flexner instances were given of the formation of gas some days before death, but it was difficult to understand how an anaerobic organism like this should be able to increase and multiply in the living tissues. In the case of pneumothorax described in the paper mentioned, it was supposed that the organism commenced to grow in a large piece of lung that had become infarcted. In Fraenkel's opinion rabbits were not susceptible to inoculation, but guinea-pigs were. The action of this organism in cases of abortion where emphysematous conditions occurred was interesting. Welch and Nuttall injected a pregnant rabbit which had a dead fœtus, and the organism developed during life, evidently in the sac of this fœtus, and a large amount of gas was found in the blood-vessels. Subsequently in America a case of abortion was recorded in which the same condition occurred, and the patient died. She was in a most emphysematous condition for some hours before death, and after death cultures were made, and this organism proved to be present.

Mr. Croly, referring to the death after amputation for compound dislocation of the ankle-joint, said that before bacteriology patients were constantly carried away by the same thing, and it was remarkable that almost all the cases amputated (in Dublin 11 out of 14) died. He, therefore, attributed death to the use of the knife.

Dr. Knott asked what was the relationship between this organism and that of anthrax in cases of quarter evil, or, as it was called in Ireland, black-quarter, which occurred in young cattle. The blackening of the affected quarter looked like imperfectly coagulated blood in the tissues.

Professor McWeeney, in replying, said that the cultures he had shown that evening were pure. It was only by the use of plate cultivations that he was able to get colonies of the large bacillus separate. A further element of difficulty was that the B. coli produced gas in sugar-media with just the same amount of vigour as the large bacillus of emphysematous gangrene. His

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experience agreed with Professor White's in finding the bacilli round the holes in the affected organs. They occasionally read of death occurring from the entrance of air into the uterine veins in abortion, and he believed this to be accounted for by the accidental inoculation of the vessels about the cervix by a dirty instrument. The case of Welch and Nuttall related by Professor White was that of a young woman who had tried self-abortion. The bacillus to which Dr. Knott had alluded as present in animals, was the bacillus of symptomatic anthrax, or *Rauschbrand*, known to the French as Chauveau's Bacillus. It was an anaerobe closely allied to the one he had shown, but differed from it in forming spores, in being motile, and not being capsulated. In answer to Mr. Croly he was not able to deal with the surgical aspect, but it appeared to him that the amputation was justifiable, and that the spreading process, which had attacked the flaps, went up the leg, and produced toxæmia with a fatal result.

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A COMPLEX CASE OF GRAVES' DISEASE.

By JOSEPH O'CARROLL, M.D., F.R.C.P.;
Physician to the Richmond, Whitworth, and Hardwicke Hospitals.

[Read in the Section of Pathology, November 30, 1900.]

CASE.—F. M'D., a fair, fresh-complexioned girl, twenty-one years of age, unmarried, was sent into the Hardwicke Fever Hospital on October 22nd, 1900, as a case of scarlatina. When I saw her next day it was evident that she was not a case of scarlatina. She gave a history of constant vomiting, at intervals of ten minutes or so, for the previous ten days. A scarlatiniform blush which was present on the trunk on admission had disappeared. The tongue was dry and cracked as in typhoid fever, the pulse 120; the temperature, 101° (38·3° C.) the evening before, had fallen to 99·6° (37·5° C.). The face was flushed and the eyes bright.

She was able to give me the following history: As to her family—her father, a coachman, is alive and well; her mother, having been a sufferer from cough for some years, appears to have lost that trouble early in 1899, and to have suffered mainly from headache, especially in the occipital region, from March, 1899, till her death in January, 1900. Three brothers and one sister, who is married, are alive and healthy; none died so far as my patient is aware. My patient is the youngest of the family, and came in for all the nursing of her mother during her last illness.

In February of this year, shortly after her mother's death, she had to go to hospital on account of swelling of her feet. After ten weeks in hospital she went home feeling well, but about the 25th of September she began to suffer from weakness and headache, and about ten days ago vomiting became increasingly frequent, till now it occurs several times within the hour.

Physical examination showed that the patient was thin, but by no means emaciated. The abdomen was concave (scaphoid), and

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the lower segment showed brownish pigmentation extending into the groins. The pulsation of abdominal aorta was unduly visible. The first sound of the heart all over the precordium was exceedingly loud and flapping, and at the same time so rough as to cause a suspicion that some early pericarditis existed. The sound could be heard without a stethoscope at a distance of eight inches from the chest. At the second left intercostal space close to the sternum was a rough systolic murmer, which was heard with decreasing intensity as far as the right and left sterno-clavicular joints, and to the left as far as the coraco-mammillary line. A provisional diagnosis of endocarditis was made.

Next day, the pulse having risen to 132, a further examination led to the suspicion of Graves' disease, and this was readily borne out by the discovery that the thyroid gland was slightly prominent when the neck was extended on the pillow; the eyeballs were slightly prominent and showed an undue amount of sclerotic; the eyelids did not follow the downward or upward movement of the eyeball efficiently, and there was a fine tremor in the hands and arms when they were extended. The diagnosis of endocarditis was, therefore, supplanted by that of exophthalmic goître.

During the next few days, the temperature being normal, the urine showed a trace of sugar; the pulse rose to 140, 150, 180; the temperature rose on the 30th October to 101·4° (38·5° C.), on the morning of the 31st to 101·8° (38·8° C.), with a pulse of 190; and she died in the evening, the temperature having fallen to 99·8° (37·7° C.), while the pulse became uncountable on account of its rapidity and feebleness. Her mind was clear up to a few minutes before death.

Necropsy.—Thin as the subject seemed, there was a considerable amount of subcutaneous fat.

Thorax.—The thymus was present as a large bilobate body about four inches long (10 cm.) The thyroid projected downwards by two bulky, turgid-looking lobes into the thorax so far as to slightly overlap the left innominate vein, and probably during life had exerted some pressure on the arch of the aorta. In fact, the portion of thyroid within the thorax was three times as bulky as that above the sternum. The lungs showed no morbid condition, but the right middle lobe was small and rudimentary. The heart showed no signs of disease,

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but it presented an interesting group of developmental defects. The foramen ovale was covered by a loose valve, free at its anterior border, and perforated by two small holes. At the anterior free border of the valve it was easy to pass a finger from one auricle into the other, though the operation was more difficult from the left to the right cavity, inasmuch as the free margin of the valve was fixed by its ends into the wall of the left chamber, so that so far as that margin went it was a left auricular structure. The pulmonary orifice had only two valves. The aortic valves were remarkable in having well-marked, free borders to the lunulæ, but the rest of the lunulæ was perforated and lacelike. There was no sign whatsoever of endo- or peri-carditis. *Abdomen.*—All the organs appeared normal, including the suprarenal bodies *Cranium.*—Sub-arachnoid fluid in excess. Pituitary body large, bulging out of the sella turcica, and consisting almost wholly of a cyst containing colloid material. Brain normal.

Histological Report by Dr. Earl, Pathologist to the Hospital:—

The thymus gland shows quite the structure that is found in that organ in a child at birth. The thyroid shows an increase in the parenchyma of the organ. Some of the acini are large, others very small. Most of them contain colloid material. A few small cysts are to be found, some of them being formed by rupture of neighbouring acini one into another. Besides the colloid contents cholesterin crystals are present in these cysts; the colloid is in parts extravasated into the tissues. The pituitary body contains a cyst lined with a cubical or flat epithelium. The contents of the cyst are colloid. The anterior lobe has a normal structure, but of the posterior lobe only traces could be found.

This case—a moderately acute one of Graves' disease—is interesting for several reasons, diagnostic and pathological. I shall not dwell on the misleading character of the erythema fugax so common in the disease, nor on the pigmentation, also common, and equally likely, in the presence of so much vomiting, to lead one off the right track. I prefer to say a few words on the

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causation of the rough systolic murmur starting from the second left inter-cartilaginous space. That the murmur was what would ordinarily be called a "functional" one is evident from the complete absence of any sign of cardiac lesions other than the developmental defects; and these could not have set up the murmur, seeing that no deviation of the blood current was permitted by them, and there was not the slightest sign of cyanosis. I conclude that the rough systolic murmur was brought about by the pressure of the engorged thyroid upon the arch of the aorta. No doubt, after death these organs were not in immediate contact, but they were so close that there was little difficulty in realising that during the systolic jump of the arch it must have impinged upon a very much bulkier thyroid than that which we saw after death. Applying this supposition to the explanation of the usual arterial bruit of Graves' disease, which is very much more widespread than it was in this case, I am inclined to account for it as being dependent on the constriction or compression of the carotids by the thyroid, itself rendered larger by the very stream which dilates these arteries. That would be one step gained in the explanation of so-called "functional" murmurs in general.

As to the causation of Graves' disease this case helps us little. Thyroid, thymus, pituitary, and cardiac abnormalities all occurring together, it would be profitless to attempt an ætiological analysis.

DR. KNOTT questioned whether the term of Graves' disease was correctly applied to this case. This disease, as he understood Graves looked upon it, was one which never had any fatal tendency, giving only an unusual, and not unbecoming, fulness to the neck. It seemed to him to be a case of abnormalities, and the peculiar

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history of the case was so different from that of ordinary Graves' disease that he was inclined to differ in the application of this name to it.

Dr. O'Carroll, in reply, said he omitted to mention that there was no bluish colour which they would expect from the perforation between the two auricles. The valve seemed to be sufficient to protect this opening.

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EXHIBITS.

[Exhibited in the Section of Pathology, Friday, November 30, 1900.]

Dr. Earl showed microscopic section of the heart of a woman who died from poisoning by phosphorus. The section showed marked segmentation of the muscle fibre, with great separation of the segments. There was no fatty degeneration of the muscle.

Mr. Arthur Benson exhibited specimens of choroidal sarcomata mounted in glycerine jelly. One tumour had been removed from a man aged sixty-two, and was a pigmented sarcoma of the choroid, apparently springing from a little in front of the equator of the eye, and extending nearly to the ciliary body in front, and to within a short distance of the optic nerve behind. Detached retina had been observed a year previously, and the occurrence of high tension (secondary glaucoma) made the diagnosis of intra-ocular tumour almost a certainty, though at no time since he came under observation could the tumour be seen with the ophthalmoscope owing to the presence of an opaque lens. The second specimen was one of non-pigmented sarcoma of the choroid—a much rarer form of tumour than the pigmented. It occurred in a man aged forty-nine, who stated that in November, 1899, the right eye began to fail, and he noticed stars flying before it. He had had no pain, and not till two months later did he notice any failure in the sight. He then saw like spiders before the eyes. When first seen in January, 1900, he had in the right eye a vision of $\frac{6}{60}$, and in the left eye a vision of $\frac{6}{6}$. A large localised detachment of the retina could be seen on the temporal side of the right eye, and

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near the ciliary body a reddish prominence (with vessels visible on it) covered by the retina, and the remains of what looked like choroidal pigment markings on it. The tumour was a sarcoma almost wholly devoid of pigment. The clinical diagnosis in these cases was often difficult, unless seen before the detachment of the retina had become complete (as in the second case); it could best be made out by the history. An extensive detachment of the retina, followed by a high tension (with or without pain), almost always indicated an intra-ocular sarcoma. The specimens had kindly been mounted by Dr. Earl.

Professor McWeeney remarked that one could readily understand tumours growing frequently where there was irritation, as, for instance, on the lower lip or rectum; or, again, where there was a constant change of function going on, as in the breast or stomach; but it was mysterious why malignant tumours should spread with so much relative frequency from the coats of the inside of the eye, and he would be glad to know if any hypothesis had been put forth to account for the frequency of tumours of the chorioid. This region seemed to him to have the steadiest and best blood supply in the body, and there was also freedom from parasites and external irritation. If it was accounted for by Cohnheim's hypothesis of embryonic remains taking on increased development, they would want to know why these remains should be so frequently there?

Mr. Croly said he wished to ask, purely for information, what was the difference beween a glioma and a sarcoma?

Mr. Benson, in reply, said that the whole pigmentary tract of the eye, the chorioid, iris, and ciliary body, were subject to these tumours, but of them all the chorioid was most frequently affected. A glioma was essentially a tumour of the retina, and the retina did not suffer from sarcoma.

Mr. J. B. Story showed a case of tuberculosis conjunctivæ. The patient was a boy aged fifteen. Swelling of lower eyelid for two months. On everting lid a small vascular tumour found springing from fornix, somewhat

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like an exaggerated case of granular ophthalmia. No ulceration, but the surface studded with minute yellowish nodules. The growth looked uncommonly like a cock's comb, and was about the size of a filbert. The præauricular gland and several glands below the ramus of the jaw enlarged. Bacteriological examination not yet completed. Tubercular structure found.

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EXHIBITS.

[Exhibited in the Section of Pathology, Friday, January 11, 1901.]

PROFESSOR MCWEENEY demonstrated blood films from a case of spleno-medullary leukæmia, which he had at present under observation. The condition was quite characteristic, the reds being 3,440,000 and the whites being 300,000 per cub. mm. Myelocytes very numerous, a large minority being eosinophil. Normoblasts extremely numerous, each field containing several; megaloblasts were also common. The nuclei of many of the normoblasts seemed to be undergoing extrusion, and free nuclei of the well-characterised normoblastic type were met with. He had tried the wet method of preparing blood films, lately described by Scott, and the new neutral stain, consisting of the compound of methylene blue with eosin, dissolved in absolute methylic alcohol, but had so far found it inferior to Ehrlich's triacid, with careful heat fixation of dry films. A second case, which he had intended to show as lymphatic leukæmia, had exhibited so marked a decrease of the lymphocytes since it came under treatment that he had decided to regard it for the present as one of temporary lymphocytosis.

DR. A. C. O'SULLIVAN said it was not impossible that the last case might turn out to be a case of leukæmia. He had observed a case, in which, the first time he examined the blood, there were large numbers of white cells in the blood, mostly of the kind which are called transitional cells. Some time afterwards he examined the blood again and found no excess of white cells. On a third examination, made a couple of months later, he found that a regular medullary leukæmia with typical cells had

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developed, so that leukæmia could certainly disappear from the blood and come back again. He remarked that the cell shown in the specimen under the microscope as a megaloblast was not what was usually understood as a megaloblast.

Professor McWeeney, in reply, said that there were in that specimen an enormous number of cells corresponding to the definition of megaloblast. The discoplasm of these cells showed that peculiar tendency to take up the nuclear stain, which makes it dirty and discoloured looking, and there was that slight want of definition about the nucleus. He must adhere to his view that the blood contained numerous megaloblasts. He hoped to lay a further communication on this subject before the Section in the near future.

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MULTIPLE CAVERNOUS ANGEIOMATA OF THE RIGHT UPPER LIMB, THORAX, AND TONGUE.

By R. CHARLES B. MAUNSELL, M.B., &c. (Univ. Dubl.); F.R.C.S.I;
Surgeon to Mercer's Hospital, Dublin.

[Read in the Section of Pathology, February 22, 1901.]

The case I bring before your notice this evening is one of such extreme rarity that it might be looked upon as a curiosity both from a pathological and surgical standpoint. I have not come across a description of a case in any way resembling it except in Cruveilhier's "Anatomie Pathologique" (1835), in which, under the section "Maladies des Veines," Tome II., Planches III. and IV., Liv. XXIII.e, he gives a drawing and description of a case similar to, but not as marked as, the one before you this evening, and as some of his remarks are extremely interesting I will give a *precis* of them, following the description of my own case.

Bridget T., aged eighteen years, was admitted to Mercer's Hospital under my care on May 15th, 1899, having been sent to me by my colleague, Dr. Lumsden. She is a fine, well-grown, bright-complexioned girl, who seems perfect in every way except for the abnormality which will be described presently. Her father and mother are alive and healthy, and she has several brothers and sisters who are also healthy, and she and her parents know of no abnormality in any of their relatives.

She carries her right hand and forearm wrapped in a cloth and buttoned inside her jacket, and when she uncovers it for inspection it is hard to believe that one is looking at a human hand and not at a large bunch of

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grapes or purple and pink flowers, so curious is the shape and so vivid the colouring. It would be useless for me to try to give a detailed description of the condition, as one could hardly grasp it without reference to the illustrations which I got made, and I will, therefore, confine myself to a few remarks descriptive of these and a few points, such as consistency, &c.

Fig. I. is a photograph showing the palmar aspect of the hand and flexor aspect of the forearm. It shows that the thumb and all the fingers, together with the thenar and hypothenar eminences, and the centre of the palm are simply a mass of prominent mulberry-shaped tumours, which vary in size from a pea to a walnut. They are for the most part slightly pedunculated, but in the various digits they spring from a common basal fulness, and there is only here and there a trace of fairly normal skin between the individual bosses. At the wrist there is a prominent round sessile tumour, slightly smaller than a hen's egg.

Fig. II. is a photograph of the dorsal aspect of the hand and the extensor and supinator aspect of the forearm. It shows that the ungual phalanges of the thumb and fingers are in the same condition as on the palmar aspect, and that the nails are distorted and hidden from view by the overhanging bunches of tumours. Starting from the ungual phalanx of the thumb and each of the fingers are five prominent raised columns, somewhat uneven in contour, and about the thickness of an index finger; the three outer ones converge on the back of the hand into one column, which comes to an end over the ulnar side of the carpus, whilst those from the thumb and index finger join into one which is continued up the radial side of the forearm for about three inches. Over the external condyle of the humerus is a round sessile tumour as large as a walnut.

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Mr. R. Charles B. Maunsell on Multiple Cavernous Angeiomata of Right Upper Limb, Thorax, and Tongue.

Fig. 1.

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Mr. R. Charles B. Maunsell on Multiple Cavernous Angeiomata of Right Upper Limb, Thorax, and Tongue.

Fig. II.

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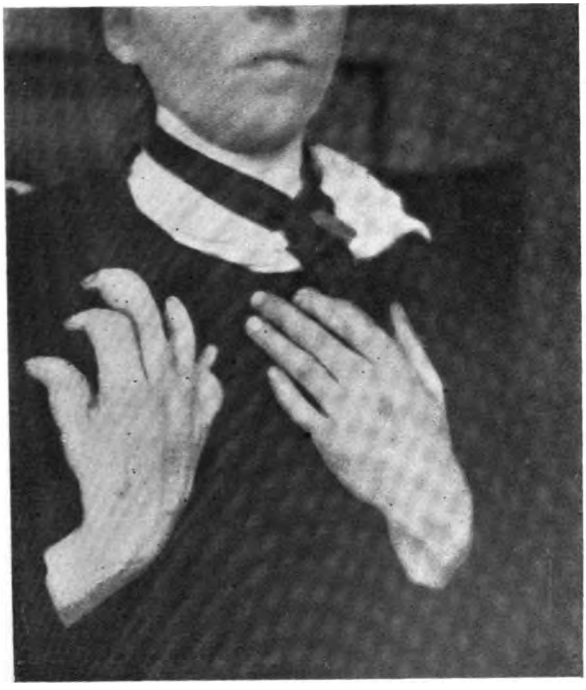

Fig. III.—Showing both hands after completion of treatment.

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Mr. R. Charles B. Maunsell on Multiple Cavernous Angeiomata of Right Upper Limb, Thorax, and Tongue.

Skiagraph I.—Right hand before treatment.

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Skiagraph II.—Showing left hand before treatment.

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Skiagraph III.—Showing right hand after treatment.

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Skiagraph IV.—Showing left hand after treatment.

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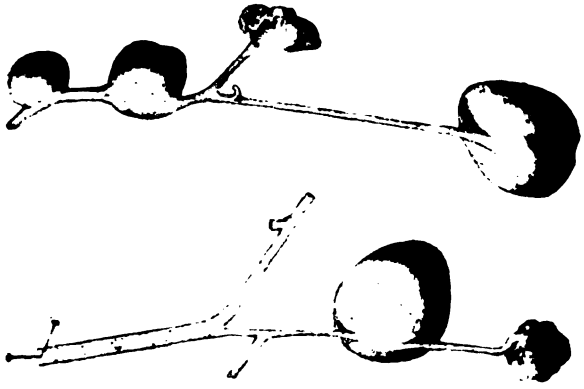
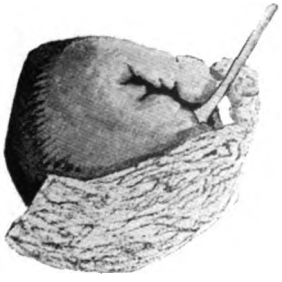
Mr. R. Charles B. Maunsell on Multiple Cavernous Angeiomata of Upper Limb, Thorax, and Tongue.



Sketches showing some of the tumours (natural size) removed with portions of the veins to which they are attached.



Tumour with unaffected overlying skin attached.

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In addition to these there are several other tumours, which do not appear distinctly, or perhaps at all, in the illustrations. In the course of the radial and ulnar veins, at about the middle of the forearm, are some sessile nodules as large as a pea, and over the course of the basilic vein as it enters the axilla is a similar nodule. On the right breast to the outer side of the nipple is a prominent raspberry-like growth, and near it is a scar where a like growth was removed some years ago. Over the right scapula are three raspberry-like growths. On the right side of the dorsum of the tongue is a smooth, deep purple patch, not quite as large as a threepenny piece, and on pulling forward the tongue forcibly a large raspberry-like growth is seen close to the epiglottis, also on the right side.

Plates I. and II. (exhibited) are water-colour drawings made while the patient sat in the same positions as for the photographs, and despite their bright appearance, I must say that they fail to give an adequate conception of the various and brilliant shades of red, blue, and purple which the tumours displayed, according to the elevated or dependent position of the limb. Roughly speaking, the smaller tumours on the ungual phalanges and on the breast and scapular region were of the colour of a raspberry; the larger tumours on the palmar aspect of the fingers and hand were like purple grapes, whilst the columns on the back of the hand and forearm, and the sessile tumours on the forearm and arm, presented various shades of slate blue which was evidently a deep blue seen through a thin white skin. On palpation the pedunculated tumours in all situations are soft and spongy, and can be readily emptied, when they look exactly like empty grape-skins; on removing the pressure they rapidly filled again like a sponge; they seem to involve the skin completely.

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The sessile tumours on the arm and forearm feel tense and elastic, and can only be slightly emptied by longer continued pressure, and there remains a solid portion which cannot be removed by pressure; the skin is movable over them and is not involved.

The columns on the back of the hand and forearm, when emptied, feel like much thickened varicose veins; the skin over them is movable and not involved, but is extremely thin. Underlying the soft skin tumours, on the ring and little fingers of this hand can be felt—hard, evidently cartilaginous, tumours distorting the shape of the fingers, but quite separate from the growths previously described.

The index and middle fingers of the left hand, together with the distal extremities of their metacarpal bones, present similar but more prominent hard tumours, but no trace of any soft skin tumours, which are altogether confined to the right side. The pulse in both wrists is normal.

Skiagraph I. shows (*a*) distorted condition of the bones of the little and ring fingers of the right hand due to chondromata, (*b*) atrophic condition of the metacarpal bones, (*c*) here and there small round dark spots in the light shadow thrown by the soft tumours; these spots are evidently calcareous bodies, which I will describe presently.

Skiagraph II. shows the chondromata on the left hand.

Previous History.—Both the patient and her parents state that when she was born she was perfectly normal, and remained so until she was nine years of age.

Her troubles began at nine years of age by the appearance of a small purple wart-like growth on the pulp of her right thumb; this was removed by her doctor. About four months after this operation numerous growths appeared on the thumb and thenar eminence. These were treated by electrolysis, but the result was disappointing, and the treatment was so painful that nothing more was

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done for six years. During this period all the other fingers became affected, starting from the tips, and then the palm became involved. All the tumours were at first freely movable beneath the skin. About two years ago a tumour appeared on the outer side of the wrist; it was freely movable, and she used to push it about, and it gradually shifted its position, and is the one which is now situated over the external condyle of the humerus (she is perfectly positive of this, and I give the story for what it is worth). A year ago she noticed the tumours on her breast, and one of these and one from the forearm were removed in another hospital for examination purposes, and further operation refused by the surgeons in charge. She did not know that she had tumours over the scapula or on the tongue. She knows nothing definite about the appearance of the chondromata, except that she noticed them some time after the other tumours began to grow.

Subjective Symptoms.—The tumours on the hand become painful during warm weather, during menstrual periods, and if the limb is carried in a dependent position. She does not mind this pain much, but she has a morbid dread of the limb, and fears to look at it, and states that nobody except her mother and the doctors had ever been allowed to see it. (I had always to put screens around her in hospital before exposing the hand for examination, as she keenly felt any observation by other patients in the ward.) She states that when she had it wrapped up in a handkerchief she would use it for such things as pouring out tea, &c., and could do crochet with the aid of the left hand. She can move all but the little and ring fingers, which are stiff, as are also the index and the proximal and distal joints of the middle finger of the left hand to a lesser degree. She is willing to undergo anything to get the limb cured, or to get rid of it altogether.

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I thought over the case and examined it carefully for some weeks, and then told her that I was of opinion that if she would submit to numerous operations I could improve her condition, and I promised that if at any time I considered the job hopeless I would rid her of the limb altogether.

Precis of Treatment.—(1) I removed the tumours from the thumb, arm, and forearm by one operation, and had them examined by Professor O'Sullivan; (2) directed by Skiagraph No. II., I removed the chondromata from the left hand, making and securing a false joint in the index finger; (3) being assured of the usefulness of the left hand, I began a series of operations on the right one, taking it bit by bit, and using numerous methods of skin grafting and flap shifting, finally clearing out the chondromata from the little and ring fingers. I had to practically remove the whole little finger subperiosteally, and Skiagraph III. shows the stunted, thick finger which subsequently grew; the ungual phalanx of the ring finger partially sloughed during treatment, as can be seen by Skiagraph III. and Fig. 3, but left a good finger; (4) I then removed the growth from the tongue. The case required eight fairly prolonged operations, extending over a period of ten months, to rectify the deformity.

Seven out of the eight operations ran an absolutely aseptic course. The one which suppurated was the one in which the thenar eminence was cleared, and the extensive scar which consequently formed caused considerable trouble by its tendency to contract, and thus cripple the thumb. The scars resulting from the operations were at first merely fine lines, but after a few months they all became hypertrophic and pink in colour. Some of them became all right again, but those on the hand and forearm are still thick and hard.

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It is now a year and nine months since the first operation, and eleven months since the last, and there has never been any sign of recurrence of the tumours.

Skiagraphs III. and IV. and Fig. 3 show the present condition of the hands. The spaces from which the chondromata were removed have filled in with bone. The right hand is not exactly æsthetic in appearance, but is practically as useful as any ordinary hand, and a proof of this is given by the fact that the girl is at present earning her living as a domestic servant, and instead of the old dread of the limb she is quite proud to show it to anybody who cares to see it.

ANATOMICAL DESCRIPTION.

There are four main varieties of tumour present—

(1) A prominent mammillated growth, involving the skin and subcutaneous tissue; the skin is in some places completely involved, but in others is superficially intact.

(2) Raised, cord-like ridges which partially involve the skin.

These two varieties empty on pressure being applied.

(3) Round, tensé, almost incompressible tumours of various sizes lying in the subcutaneous tissue, apparently having little connection with any surrounding tissue, and easily shelled out entire.

(4) Round or fusiform tumours occurring in chains connected together by veins, and apparently growing either in the veins or in their walls. These are also tense and incompressible.

In all these varieties of tumour round, white, shot-like bodies can be found and easily shelled out. They vary in size from the smallest sized shot up to buckshot, and are evidently calcareous in nature.

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The distribution of the tumours is along the course of the veins, but in most cases it is the branches and not the main veins which are involved. The palm of the hand and the fingers are simply a close network of venules, which pass through from front to back, connecting the various groups of tumours. These venules pass through muscles, &c., without distinction, and in places closely invest the bones and joints.

The chondromatous tumours do not appear to need any special description beyond what the microscope will reveal.

PRECIS OF CRUVEILHIER'S CASE.

The specimen was obtained *post mortem* from the body of an old woman who had been under the care of Professor Rostam in la Saltpêtrière. There was no history of any kind. The inner side of the forearm and hand and dorsum of the fingers alone were affected, and the description of the colours, &c., are practically identical with my case. He states that some involve the skin, but some do not, but it is thinned, although freely movable. He incised one and found it cavernous in structure and containing numerous round, whitish, hard bodies, which he describes as bony, and calls them phleboliths. He says that some of the tumours occur in the subcutaneous tissue without being connected to any neighbouring structure. He says that he does not believe the tumours arise from the veins, as the main vessels and their branches are normal, and he says that they must be true erectile tissue, accidental in origin.

He gives three varieties of contents:—(1) Erectile tissue with circulating blood; (2) cavernous tissue full of clotted blood; (3) bony globular phleboliths, yellow and of various sizes, from a millet to a pea. He states that he never

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saw a case like it before, and that he never saw phleboliths formed in accidental erectile tissue.

Note.—I have since seen the girl several times, last on September 10th, 1901, and she has uninterruptedly followed the calling of general servant, and uses her hands freely and without recurrence, except in one tiny spot, which I cauterised.—C. M.

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STENOSIS OF THE TRICUSPID, MITRAL, AND AORTIC ORIFICES.

By SIR GEORGE DUFFEY, M.D.;
Past President, R.C.P.I.;
Physician to the Royal City of Dublin Hospital, &c., &c.

[Read in the Section of Pathology, February 22, 1901.]

Case.—C. R., aged thirty-two years, was admitted to the Royal City of Dublin Hospital on January 8th, 1901, suffering from dyspnœa, cough, and other symptoms of cardiac distress. He was cyanotic, had considerable ascites, and his feet and ankles were œdematous. He had been in hospital two years previously suffering from similar symptoms, and had frequently, in the interval, been under observation, as he was in the habit of coming to get his abdomen tapped for the removal of ascitic fluid, which rapidly accumulated. At first paracentesis had to be performed nearly every week, but subsequently the intervals between successive tappings had gradually lengthened, so that prior to his last admission he had not been tapped for a year. Altogether he had been tapped 40 times. He was a man of fine physique; and he stated that with the exception of some occasional heart trouble, which dated from his boyhood, he had always been strong and healthy, and had been able up to his last attack to do his work as a wine-porter. He used to drink heavily.

As to his early medical history, I am indebted to Lieutenant-Colonel Whittaker, Medical Attendant of the Royal Hibernian Military School, for the following particulars:—

C. R. was admitted to the school in August, 1878, at the age of ten years. He had had measles previously. On attaining the age of fourteen it is noted that his chest measurement, height, and weight were much above the average for a boy of his age. He was, however, rejected for the army by the medical officer then in charge of the school, who made the following note against his name:—"Unfit; marks of treatment over region of heart, with excited action, after acute rheumatism." But while in the school he appears to have been only once in hospital—viz., for "rheumatism," for 11 days in May, 1883. In July of the same year he went up for enlistment into a cavalry

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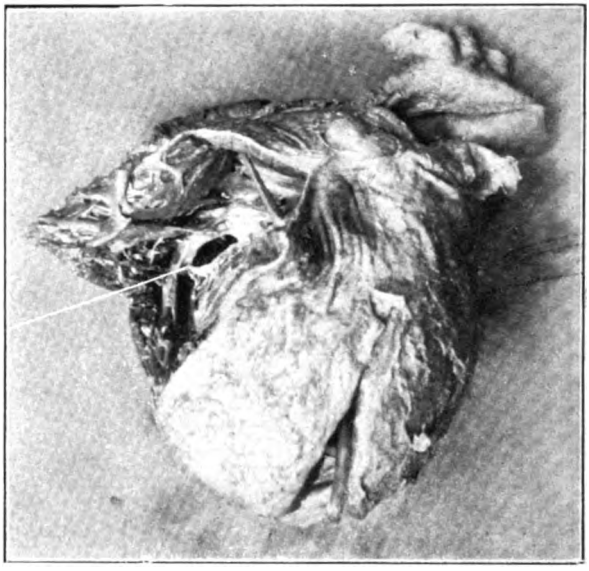
Sir George Duffey on Stenosis of the Tricuspid, Mitral and Aortic Orifices.



From a Photo] [*By Victor Smyth, Dublin.*

* In the above illustration a line is drawn from the constricted tricuspid orifice.

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regiment, but was rejected for "valve disease of the heart." He left the school in September, 1883. Subsequently, it would seem, he managed to pass a medical examination, and enlisted. After serving for a short time in a cavalry regiment he was invalided for heart disease, and discharged the service as medically unfit. Colonel Whittaker also has informed me that the father of C. R. was a pensioner, and had aneurysm of the aorta; and that his mother was reported to have had a chronic "chest affection."

On examination upon admission it was found that his pulse was very feeble, irregular, and intermittent. The area of cardiac dulness was extended in all directions. The impulse was weak and diffused. The apex beat in the 6th intercostal space, one inch outside the nipple line. A presystolic thrill was perceptible over the mitral area. In the same situation there was a double murmur, also a systolic murmur in the aortic region and at the ensiform cartilage. There was visible pulsation at the epigastrium and in the jugular veins, especially in the left jugular vein. The superficial veins of the thorax and abdomen were distended, particularly on the left side. His lips, ears, and fingers were blue. After removal of 235 oz. of clear serous fluid from the peritoneal cavity, the liver and spleen were both found to be enlarged. He was slightly icteric, and there was a great deal of bronchitis. The urine was scanty, but did not contain albumen. He suffered from diarrhœa and gastric irritability. Temperature subnormal.

After a slight rally dyspnœa again supervened. He became comatose and was apparently moribund, but again rallied for a few days. Cheyne-Stokes respiration, however, succeeded. He gradually grew weaker; the pulse was imperceptible; he became delirious and slightly aphasic, and died on February 4th, 1901.

The clinical diagnosis was combined mitral stenosis and incompetency and aortic stenosis.

POST-MORTEM EXAMINATION.

Thorax.—On opening the thorax the lungs did not collapse. The anterior surface of both lungs was covered with a thick layer of adherent pleura, especially marked on left side, where the pleura was closely adherent to the pericardium. There was a large amount of clear serous fluid in both pleural cavities.

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Both lungs were enlarged, congested, and extensively pigmented. There was slight emphysema at their margins. On section, bands of fibrous tissue, extending from the thickened pleura, were observed passing through the lungs. The pericardium was thickened and closely adherent everywhere to the heart and to the adjacent pleura. In shape the heart—which was greatly enlarged—was somewhat square. It weighed 25 oz.; its girth measured 14½ inches; vertically, from the commencement of the aorta to the apex, it measured 8 inches; all the chambers were empty. The right auricle was dilated; its cavity measured 4 inches vertically by 3½ inches transversely, and its walls were slightly hypertrophied. The tricuspid orifice was extremely contracted; it admitted the middle finger only. The valves were thickened and fused together by their free margins in the form of a funnel, which projected into the ventricle. The mouth of the funnel was an oval-shaped opening, measuring ¾ in. by $\frac{5}{16}$ in. The left curtain of the valve was adherent to the septum, the walls of the ventricle were hypertrophied, and the endocardium over some of the carneæ columnæ was thickened. (See Plate). The pulmonary artery and orifice were normal. The walls of the left ventricle were hypertrophied, $\frac{1}{16}$ of an inch in thickness. The slit-like mitral orifice was extremely contracted—more so than the tricuspid. It admitted only the tip of the index finger. The valves were thickened and atheromatous, and the endocardium of the ventricle was of an opaque and whitish colour. The aortic valves were competent to the water test, but much thickened and calcified where they projected into the ventricle; and the orifice was so contracted that it admitted only a No. 10 catheter. The left auricle was somewhat dilated, its lining membrane thickened and atheromatous. The aorta was atheromatous.

Abdomen.—There was a considerable amount of fluid in the peritoneal cavity. The peritoneum in many places appeared whitish and thickened. The intestines and abdominal viscera were matted together by firm adhesions. The liver was large, smooth, hard, and cirrhotic; it weighed 3lbs. 8oz.; its capsule was thickened. [The frequency of peri-hepatitis in cases of tricuspid stenosis was first noticed by Pitt.] The common bile duct was almost occluded by apparently a papilloma (?), which extended a short distance into the gall-bladder, the mucous membrane of which was thickened. The spleen was also affected with chronic venous stasis. It weighed 9 oz., and its capsule was

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thickened. The pancreas was hypertrophied and firm.[a] The kidneys were congested; each weighed 4 oz. The microscopic appearances of the three latter organs presented nothing unusual beyond those of chronic congestion.

REMARKS.

Although stenosis of the tricuspid orifice is looked upon as an unusual occurrence, and its existence but seldom, as in my case, diagnosed during life, a considerable number of cases in which it has been met with on the *post-mortem* table have now been recorded. To the late Dr. Hayden, of this city, is due the credit of being probably the first to collect a series of cases in which this lesion was found after death, and to have laid down the physical signs by which it might be recognised, when present, during life. He exhibited at the Pathological Society of Dublin three cases of the kind that had been under his care, in one of which he diagnosed the lesion before death. He also published the notes of two other cases, in both of which he diagnosed the existence of tricuspid stenosis; but he had not the opportunity of testing the accuracy of his diagnosis by *post-mortem* examination. A number of cases have also been collected by Fenwick, Leudet, Ashton and Stewart, Herrick, Shattuck, and Pitt, the study of which shows several points of similarity between a large proportion of them and my case. These points are as follows:—

(1) That tricuspid stenosis is almost invariably associated with mitral stenosis; and that the constriction of the latter orifice is generally greater than that of the tricuspid opening.

(2) That in the larger proportion of these cases (say 25 per cent.) of tricuspid and mitral stenosis there is also marked contraction of the aortic orifice.

[a] Corroborating the observation of Dr. Hale White, that long-standing difficulty of venous flow, due to disease of the heart, will cause induration and fibrosis of the pancreas as of other organs.—Diseases of the Pancreas. Guy's Hospital Reports. Vol. 54, p. 28.

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(3) That in at least 50 per cent. of the collected cases of tricuspid and mitral stenosis there is an antecedent history of rheumatism of some form or other; and that the stenosis is most frequently the result of an endocarditis of rheumatic origin, and probably never congenital.

The foregoing statements are chiefly based upon the tables of 154 cases collected by Leudet and by Herrick (quoted by Gibson). They also show that tricuspid stenosis was met with more frequently in women than in men, in the proportion of 3·5 to 1. The cause for the relatively greater predisposition of the female sex is held by Fenwick to be that the work of women is less laborious, and that in consequence the action of the heart is less powerful. As a result back pressure is slighter, and therefore the valve disturbance is less than in men. In men laborious occupation, greater compensatory hypertrophy, and more powerful cardiac action prevent the inflamed edges of the valves from adhering together.

Dr. George Newton Pitt states that although tricuspid stenosis is decidedly a rare lesion, yet he has collected from the records of a single hospital—Guy's—87 fatal cases during a period of 26 years, out of 12,000 necropsies. A third of the cases proved fatal between the ages of twenty and thirty, and more cases ended in death between the ages of thirty and forty than between ten and twenty. This, he thinks, corroborates the conclusion that the lesion, in the majority of cases, is the result of severe rheumatism, but requires many years for its production. An analysis of the cases collected by Dr. Fenwick and others also shows that the majority died between the ages of twenty and forty. Taking into account the necessarily serious nature of the affection, tricuspid stenosis seems to be a disease of considerable duration. Duroziez (quoted by Pitt) considers that the length of life varies with the degree of stenosis, the average age at death, when the orifice would not admit one finger,

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being thirty-two years; and forty-two when the orifice admitted one finger. Dr. James Mackenzie, in his interesting study of the liver pulse—which, when present, and of what he terms the auricular type, is, he suggests, the diagnostic sign of tricuspid obstruction—says that the stenosed tricuspid valves may, by protecting the auricle and preserving its functions, tend to modify the extreme backward pressure of blood upon the venous system, and thus prolong life. When the duration and extent of the cardiac lesions present in my case are considered, the tolerance exhibited by the patient to his disease is remarkable. He was also able to follow a somewhat laborious occupation until up to a month before his death. Dr. David Drummond has published a case of stenosis of the tricuspid, mitral, and aortic orifices in a woman aged forty, which is also interesting as illustrating the length of time a heart damaged severely in early life sometimes struggles successfully against enormous odds to maintain a state of efficiency. Similar instances are recorded; and the latency in the symptoms in such cases has been attributed to the slow development and the gradual extension of the lesions.

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CASE OF FRIEDREICH'S ATAXIA.

Dr. Travers Smith exhibited a girl, unmarried, aged twenty-four. As far as she could trace her family she knew of no other instance of the disease. Her father, who was an only child, is alive, and over sixty; her mother, who was one of five daughters, but had no brother, died of "bronchitis" at the age of sixty. The patient herself is an only daughter, having four brothers older than herself. Her brothers, between them, have twelve children, the eldest boy aged fourteen, the eldest girl aged ten. Patient does not know whether any of her maternal aunts have children or not. She gave the following history of her disease. She was healthy up to the age of fourteen. She then got "nervousness" and a "trembling," so that she used to let things fall from her hands. About this time she began to "stagger" occasionally when walking. She stated that at sixteen she got perfectly well again, and remained so till the age of twenty, when she got "influenza," and was ill for four months. After this the "staggering" came on again. She got weak in the legs, especially the left, and some time after she "began to lose the use of her hands." These symptoms got worse, till at the age of twenty-two she became unable to walk without a person on each side of her to support her.

Present condition.—Marked paralysis of flexors of hips and of abductor and abductors of femora; the feet show a tendency to talipes varus and inward pointing of the toes; the toes have their metatarso-phalangeal joints somewhat over-extended, the inter-phalangeal over-flexed; the spinal and abdominal muscles are weak; there is

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marked kyphosis, with some lateral curvatures in lower dorsal region; the eyes show lateral nystagmus (no other defects); the tongue is tremulous and jerky; speech is indistinct and "drunken" in character; occasionally choreiform jerks are to be noticed in head, arms, and body; inco-ordination is extreme in the legs, much less so in the hands; there is diminished tactile sensibility in the legs, sensation is normal in soles of feet; muscle sense appears normal, as the posture of the limbs is easily recognised, and the patient can perceive differences in weights; the knee-jerks and deep reflexes of arms are absent; the plantar reflexes are increased, and show Babinski's sign; sphinteric control is normal as is menstruation; there are no nutritional disturbances present; the muscles react normally to electricity. All the abdominal and thoracic organs appear normal except the heart, which is abnormally rapid under the least excitement, and shows signs of mitral stenosis.

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CHANGES IN THE KIDNEY IN A CASE OF TYPHOID.

[Read in the Section of Pathology, Friday, March 22, 1901.]

Dr. A. C. O'Sullivan read a paper on this subject.

Professor McWeeney said that they knew that the bacilli were, almost as a matter of course, excreted by the kidneys, and that they made their appearance living and active in the urine. Hence they deducted that the urine, just as the fæces, ought to be carefully looked to. The bacilli were quite distinct in the preparation shown. Though they were not proved by cultivation to be typhoid bacilli, the grouping and appearances were so characteristic that he did not think anyone accustomed to studying the appearance of them in specimens could have any possible doubt. The way in which they formed little groups, visible with low powers, and serving as guides to the position of the bacilli, was described originally by Gaffiky in his original paper of the proceedings of the German Health Office. He asked what was the nature of the inflammatory cells comprising these nodules in the kidney. His object was to ascertain whether they were polynuclear cells or mononuclear, because the rôle of the typhoid bacillus in producing suppuration was interesting, and there was no doubt that the bacilli were frequently found in abscesses often occurring months after typhoid fever. It was not yet clear, however, whether the bacilli alone caused the abscesses or whether they secreted substances which were chemotactically active towards the polynuclear leucocytes of the blood. If they found the group of the bacilli surrounded by typical polynuclear leucocytes, *alias* pus cells, it might aid them in

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their conjectures. He wished to ask, further, if the red hæmorrhagic spots between and in the tubules contained the bacilli also, and whether the President considered that the hæmorrhages were produced in the kidney as a result of the excretion of the organisms by the kidney, or whether it was due to small emboli of the organisms washed into the kidney and setting up hæmorrhage. A comparison between these and the red spots on the skin was interesting, as it was possible to find bacilli in blood from the later, and whether the mechanism producing these skin spots was hæmorrhage or otherwise was an interesting point.

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EXHIBITS.

[Exhibited in the Section of Pathology, Friday, March 22, 1901.]

Dr. H. C. Earl showed a dermoid cyst of the ovary, with almost complete calcification of its wall. The cyst was bilocular. The larger cavity, the wall of which was completely calcified, contained a thin fluid holding numerous cholesterin crystals in suspension, and a few hairs. The small cavity contained a mass of sebaceous material and numerous hairs. The calcification of its wall was less complete than was that of the larger cavity.

Dr. H. C. Earl also showed a dermoid cyst of the ovary, which contained a well-formed pseudo-mamma. Its nipple contained numerous hairs and sebaceous glands, as well as some very large sweat glands. There was no mammary gland tissue present.

Dr. H. C. Earl also exhibited an epidermoid cyst from the sole of the foot of a man aged about forty years. It lay over the head of the first metatarsal bone, and was removed on account of the great inconvenience the patient suffered. The cyst was almost spherical in shape, and one-fourth of an inch in diameter. The epidermis lining it was thick, and all its layers distinct and well marked. There was no papillæ. The contents of the cyst were desquamated, horny epidermic scales.

Dr. Travers Smith exhibited the heart of an elderly man, which showed extensive calcification of the myocardium. The calcareous deposit, which was embedded in the wall of the left ventricle, appeared as large, very irregular masses, four or five in number, each about the

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size of a filbert. At several places these masses projected into the lumen of the ventricle. The aortic and mitral cusps showed litle signs of endocarditis. There was extensive atheroma of the coronary arteries. The clinical history of the case was unknown.

Dr. Travers Smith also showed a cyst about the size of a hen's egg, the wall of which was formed of laminated fibrous tissue with an outer calcareous shell. It contained soft, cheesy material, which showed microscopically fatty *débris* and large numbers of cholesterin crystals. This cyst had been found in the spleen of an aged man, one half embedded, the other projecting from the surface. The clinical history was unobtainable. Dr. Travers Smith thought it was possibly a calcified hydatid cyst, though no "hooklets" could be demonstrated microscopically.

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THE SCOPE OF X-RAYS IN DENTAL PATHOLOGY.

By GEORGE J. GOLDIE, L.R.C.P. & S. Edin., L.D.S. Edin.,
Assistant Dental Surgeon, Incorporated Dental Hospital of Ireland;

AND

WILLIAM S. HAUGHTON, M.B.,
Surgeon to Steevens' Hospital,
University Demonstrator of Röntgen Photography,
Member of Röntgen Society of London.

[Read in the Section of Pathology, March 22, 1901.]

It is with the greatest diffidence that I beg to lay before you the remarks which shall constitute my paper this evening on the scope of X-rays in dental pathology. Apart from my personal inability to treat it as it deserves, I am seriously handicapped by the technicality of my subject. Dentistry has become so highly specialised within the last twenty years as almost to have passed beyond the ken of her great mother Medicine, and accordingly it is with no small trepidation that I attempt to place under your notice in readily appreciable form and without the almost necessary amount of highly technical details, problems which the general medical or surgical mind cannot readily grasp without more special study than the busy practitioner can afford to bestow on the subject. The one thing which gives me pleasure in reading a paper here to-night is that I am given the opportunity of rendering honour to whom honour is due, and of according to a Fellow of this Academy the premier position in the prosecution of the researches whose results shall be presently recounted. I refer to one whom you all know, and whose enforced retirement from the fields of dental practice and politics, where he has done so much good

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work, is deeply to be deplored—Dr. Richard Theodore Stack, to whom the credit of having first applied Prof. Röntgen's discovery to dental pathology must unquestionably be given. It was my privilege to work with him in our earlier efforts to prove the utility of the rays, and if for purposes of brevity and conciseness I do not distinguish between his work and my own, yet be it understood that to his enthusiastic taking up of the subject is probably due the fairly well-defined status of the X-rays in dentistry. With this tribute may I be permitted to preface my paper.

The methods of investigating pathological conditions in the body of the jaw are so few and so uncertain that any addition to their number is welcome. This is particularly so when we remember that if any attempt is to be made of the nature of mechanical repair after the acute states of morbid change have passed, an accurate knowledge of the condition of the part to be operated upon by the dentist is indispensable if the operation is to be undertaken with any intelligent idea of the relative chances of failure and success; while in the less intricate field embraced by the operation of tooth extraction for the immediate relief of pain from inflammation or its sequelæ, the discovery of any abnormality, which is the chief difficulty in such cases, is of the greatest service where it can be diagnosed.

The introduction of X-rays to the purposes of general pathology came some four years ago as nothing less than a sensation, and the extravagant prophecies for and against its being a permanent factor in diagnosis have been so far tempered by experience as to render the usefulness of the new method an accomplished fact. To this chorus of applause the minor branch of surgery, which it is my lot to practise, lends her little note, and without

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claiming for a moment to have exhausted the subject I shall, with your indulgence, lay before you the more interesting cases of the last four years.

An enumeration of the methods at our disposal at the date of Prof. Röntgen's discovery will possibly best show the immense boon he has conferred on dentistry, and these were:—

1. Visual examination by merely looking.
2. Examination by probing and by palpation.
3. The history of the case (which in dentistry is of very little value on account of the patient's ignorance of what has happened even in the way of operation in his mouth).

For example, in the case of a broken tooth, we could see that the crown had been removed, leaving the fang or fangs embedded in the jaw, we could palpate the part with no result at all, we could probe and find in some cases how far down the fracture had extended, and from the history could only be gleaned the self-evident fact that an attempt had been made to extract the tooth without success. As regards how much of the tooth still remained in the jaw we had no knowledge beyond the variable one afforded by anatomy; while of any malposition or abnormality in number of roots, or in their shape—by far the most common cause of fractures of teeth—we could have absolutely no idea. For aught we could know to the contrary the fangs might be so twisted or bent as to be interlocked with the roots of another tooth; they might be attached firmly to the root of another tooth by gemination, pretty much as the radius and ulna or tibia and fibula may be in malunion after fracture of both bones, or they might be exostosed so as to make extraction impossible without the removal of a large piece of the surrounding bone. The importance of diagnosing between these conditions will be seen as bearing on treatment; whether

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or not an anæsthetic would be necessary, and if an anæsthetic were indicated, whether a major or a minor one should be used, and whether any preliminary gouging or trephining of bone would be called for.

Regarding all these important points we were absolutely in the dark until Prof. Röntgen gave us his rays, and our prognosis, even when it turned out to be correct, was, in nine cases out of ten, mere lucky guess-work. Now things are completely changed—how completely I shall ask you to judge from the slides which will be shown on the screen this evening.

With your permission, and for the sake of clearness, I shall limit myself to the following list of conditions in which the X-rays are more obviously useful, and demonstrate them, with Dr. Haughton's help, on the screen. These are:—

1. Fracture and dislocation of teeth in the jaw.

2. Fracture of the jaw itself.

3. The diagnosis of inflammation round the roots of teeth—alveolar abscess.

4. The diagnosis of inflammation giving rise to symptoms remote from the seat of lesion—as neuralgia, trismus, &c.

5. The treatment of impacted and incoming wisdom teeth.

6. The normal eruption of the permanent teeth following the temporary or milk teeth.

7. Abnormal eruption of the same.

8. The absence or presence of any given tooth in the body of the jaw when its eruption has been abnormally delayed.

9. The progress of regulation of the teeth when they are malposed on eruption or irregular in the jaw.

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10. Many purely clinical dental conditions, which can only be mentioned without being described.

11. Foreign bodies in the antrum of Highmore.

I shall now proceed to go through this list as briefly as possible.

FRACTURE OF TEETH IN THE JAW.

FIG. I.—This skiagram was taken of the right side of the lower jaw of a man aged forty at a little in front of the angle. The history was that an attempt had been made, down in the country, to extract the wisdom tooth or third molar of which this is the remaining fragment, as it appeared when he came into my hands. The tooth (as often happens in that region) had been attacked by caries at the neck, and had been so weakened by decay that when the forceps were applied the crown had snapped off, leaving the fangs behind. To judge from the amount of œdema evident when the patient presented himself, a very determined effort must have been made to extract the tooth. His condition on examination proved bad enough. The pain he was suffering had set up spasm of the masseter muscle and trismus, so that he could hardly open his mouth more than half an inch, but by reflected light there could be seen over the region of the wisdom tooth a large foul œdematous tumour of puffy granulations, bathed in pus and exhaling the most abominable odour. The tumour, which was about the size of a large cherry, was the biggest I have ever seen; it invested the broken roots and covered them completely. The limited amount of probing which could be done only showed the presence of a fractured stump. He was put under ether, and the mouth opened, but this revealed nothing further; an attempt by my partner, Dr. Stack, to extract the stumps was now made, but failed, as in the very swollen condition of the parts

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it was impossible to locate the roots. During the remainder of the anæsthesia granulations were scraped away and the wound packed with gauze and for the succeeding three days the mouth was freely irrigated with warm, mild, antiseptic fluids. These measures had the effect of subduing the surrounding inflammation, and although trismus was still marked, a more deliberate examination was possible. What appeared to be the upper and posterior edge of the fang could be indefinitely made out, while a prolonged probing revealed simply nothing, because the structure of the dentine and cementum composing the tooth fang had been so much softened by caries that their characteristic hard feeling to the probe was destroyed, and this important diagnostic difference between the fractured stumps and the surrounding bone entirely lost. We were, therefore, in the position of knowing of a root or roots in the jaw bone, causing the most violent inflammation, without knowing how much of them remained or where exactly the force should be applied to effect their removal. At this time the Röntgen-rays had been making a noise in general surgery, and I suggested to Dr. Stack that they might be tried in this case. The imperfect photograph which you see was taken on a glass plate. It is not such a good picture as many I shall show you to-night, but it demonstrated the position and dimensions of the fractured tooth, and, what was almost of more importance, that a new and certain agent in diagnosis had come to our aid in dentistry. The patient was put under ether next day, and the operation successfully completed. It is with no small satisfaction that I show you this, though imperfect, the first dental X-ray photograph taken in Dublin, and to the best of my belief, and as far as the literature on the subject records, in the whole world.

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FIG. II.—This slide represents, also, the right side of the lower jaw of a man, aged twenty-five, who presented himself complaining of severe pain in the right upper and lower jaws and in the eye and ear of the same side.

He pointed to the wisdom tooth as the cause of the pain, and insisted on its being taken out immediately. I examined the alleged offender carefully, but failed to find the slightest trace of anything which would give rise to trouble in it beyond some pain on pressure, which was, however, common to nearly all the teeth on the same side of his head. Between the first molar and wisdom tooth was to be seen, on the surface of the gum, a small fragment of the root of the second molar, evidently long since lost, and it, too, was found to cause pain on being sharply tapped. In the absence of any flaw in the adjacent teeth I diagnosed this fragment to be persumably the cause of the pain and neuralgia, but the apparent insignificance of the suspected cause was so far out of proportion to the magnitude of the symptoms produced that I really could not confidently make any statement in the matter. We had thus in this case four or five teeth and one small piece of a stump, all causing pain to the same degree. Which of these was the offender? On questioning the patient farther I learned that the second molar, of which the root fragment was a part, had been extracted in London some seven or eight years previously, and that a small part of the end of one of the roots had been left in as being impossible to extract easily, and too small to give rise to any trouble. He derided the idea that this could be the defaulter, and insisted on the extraction of the wisdom tooth. I declined to do so on such scanty evidence, and asked Dr. Stack to look at the case. He spent a full half hour in examining as I had done, but could not satisfy himself any more than I. On our

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advice an X-ray photograph (Fig. III.) was taken by Dr. Haughton, and judge our surprise when, instead of a small tip of a root, were seen the two entire fangs of the second molar squeezed in between the first molar and the wisdom tooth. They had been tilted forward obliquely by the wisdom on its eruption some five years previously till that tooth almost touched the posterior surface of the first molar. The diagnosis was thus made easy to us and to the patient, who was, I am sorry to say, more impressed by the mendacity of the London dentist, who had broken his second molar, than by the narrow escape he had had of losing one or perhaps two sound teeth to no purpose. Besides clearing up the diagnosis this skiagram was of the greatest service to me when I came to remove the two fangs, for after extracting the posterior one I might very easily have missed the anterior *had I not seen it here in the photograph* before the operation. It occupied almost the normal position of the posterior root of the tooth in the front of it, and, as a matter of fact, even with the aid of the skiagram, I had considerable difficulty in locating it. But for the X-rays I should probably have left it there to occasion trouble at some future time. I cannot conceive of any case which will better illustrate the comfort and certainty to the dentist, and the consequent benefit to the patient which Prof. Röntgen has conferred.

Fig. IV.—This slide shows the incisor region of the jaw of a woman, aged forty-five. She came to me complaining of pain and swelling over the right central incisor of about three years' duration. The swelling was considerable, and, on being pressed, pus could be made to ooze from one point at the neck of the tooth. Apparently this was an alveolar abscess. The tooth was very slightly loose, and when moved in its socket it seemed to have no depth of attachment. I suspected fracture, and ques-

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tioned her to find out some history of a blow or fall, but she was absolutely positive in her denials of any such mishap. In spite of this I gave it as my opinion that the root had been fractured. An X-ray photograph showed my diagnosis to be correct. Even with its evidence before her she could not remember any time when violence had been directed against the tooth, and it was only after several days' thinking that she brought to mind the fact that some little time before she had first felt slight trouble in that tooth a child in her arms one day had suddenly thrown back his head and hit her in the mouth. This was unquestionably the cause. The case is interesting as showing how the X-rays enabled me to establish a history and a diagnosis *in direct antagonism* to the facts as given by the patient.

This slide (not reproduced) is worthy of notice because it displays fracture and dislocation of teeth side by side, the result of a hunting accident.

FRACTURE OF THE LOWER JAW.

In fracture of the jaw surgery and dentistry have each something at stake. While the injury is one which cannot usually be treated except by a surgeon, yet there are conditions in which the opinion of the dentist may occasionally be of some value. It will be at once evident that teeth displaced or damaged by the blow which occasions the fracture are liable, speaking generally, to retard union of the bone in two ways—either by getting in between the fragments, and so mechanically preventing their reduction, or also by setting up or by keeping up suppuration; while if teeth so implicated are inflamed or abscessed any discharge from them will infect the larger wound persistently and retard the result aimed at by the surgeon.

The first of these can usually be seen and prevented by the surgeon when he is setting the fracture, but the second

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is not generally so self-evident, and could only, I beg to submit, be diagnosed by one accustomed to deal with inflamed and abscessed teeth as such.

The only case of fracture in which I have used the rays presented itself some two years ago. It was situated on the right side of the lower jaw, and occurred in the hunting field from the violent contact of a horse's hoof with the chin of its rider who had come to grief at a fence. The fracture was compound, without very obvious displacement, and the fragments were impacted on each other at a slight angle, which, as the force was delivered from below, pointed upwards. Some of the upper teeth were splintered by the violence with which the teeth of the lower jaw had been driven against them, and it was for the extraction of one of these, the second upper molar, on the right side—shattered completely, and with the living pulp exposed—that the patient, a robust man of forty, came to me some ten days after the accident. He was in great pain, and could not open his mouth more than a quarter of an inch from trismus, and consequently I could not make a satisfactory examination. I had skiagrams taken of lower and upper jaws at the seat of injury, and thus procured a clear picture of the seat of my work. (Figs. V. and VI.) Besides the difficulty of seeing the *débris* of the tooth to be taken out, concealed as it was by inflamed and lacerated gum, I greatly feared that in opening the mouth sufficiently to reach it I should reproduce the fracture, which had begun to unite, and in order to guard against this most untoward accident I was anxious to know if possible the exact direction and extent of the bony lesion. These points are not so clearly shown as one would wish in the skiagram, as, ten days having elapsed since the injury, the osteoblasts had been busy laying down calcareous matter, which, of course,

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obstructed the passage of the rays, but none the less the photograph was of great assistance. The patient was put under ether, and two Ferguson gags were introduced by my friend, Dr. Chance, one at each side of the jaw and close to the angle. The mouth was opened sufficiently by this means to enable me to extract two stumps and scrape out the splintered remains of a third. So far all was well. Three days later the patient returned, still in considerable though lessened pain, and asked me to extract the two bicuspids in the lower jaw adjacent to the fracture, as it was thought they had been damaged by the accident and were keeping up irritation. I produced the skiagram, and showed him that the teeth in question were absolutely uninjured, neither fractured nor dislocated, and contented myself with grinding a little off the surface of all the teeth near the fracture, and so abolishing the angle which, constantly tapping against the upper teeth when the jaws came together, was keeping up periostitis and trismus. I further made a silver splint for the sound side which, had he required to use it, would have sustained the weight of the lower jaw in biting, and have removed all strain from the injured parts. After four days he wrote saying that the pain and trismus had greatly diminished, that he was comfortable, and that he further thanked me for refusing to extract the good, sound tooth. The case went on uninterruptedly to recovery, and when I saw him, four months ago, no trace of deformity was visible. The teeth implicated were all healthy.

THE DIAGNOSIS OF INFLAMMATION ROUND THE ROOTS OF TEETH GIVING RISE TO SYMPTOMS (*a*) LOCALISED TO THE SEAT OF LESION, AS ALVEOLAR ABSCESS; (*b*) REMOTE AND OF REFLEX ORIGIN, AS NEURALGIA, &C.

The problem in operative dentistry which is perhaps the most difficult is the treatment of dead teeth—teeth

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in which the pulp or nerve has died and become putrescent. This morbid change is usually consequent on exposure of the pulp by decay of the tooth substance, or it may be occasioned by a blow or by any sudden change of temperature. Sometimes it occurs without any apparent cause, and the patient comes complaining merely of pain without any other outward or visible symptom. The treatment of such cases is important, not only because the teeth affected must themselves be saved, but because of symptoms which may arise from them afterwards in remote situations. When the pain can be located, as toothache, to one tooth, the diagnosis is easy, but when its area is not so limited—when it takes the form of neuralgia, of tic, of tenderness on percussion of some one or all of the teeth in both jaws, of acute or chronic glandular enlargement, or of reflex trouble in the eye or ear, then it is that one's skill in diagnosis is often entirely at sea. The anatomical character of the fifth nerve which supplies the teeth, is such that irritation of any one of its dental branches may produce reflex trouble in any one of its areas of distribution. A moment's reflection of this single fact will be sufficient to show the difficulties in the way of a correct diagnosis of the point of lesion when one of these areas is the seat of pain, and a glance at the number of reflex channels afforded by the fifth nerve will in like manner emphasise the great utility of any agent which will demonstrate that point of lesion accurately. Happily for the dentist and patient, a pulpitis which can produce such far-reaching results as these just referred to is seldom unaccompanied by percimentitis or periostitis, and it is in showing the rarefaction and absorption of bone which is characteristic of these pathological conditions that the X-rays are valuable. A dead pulp not accompanied by periostitis cannot itself be demonstrated

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by Röntgen photography, but its effects on the surrounding tissue as a circumscribed or diffuse abscess cavity can be seen, as the following slides will show.

FIG. VII.—This case is one in which the patient complained of a dull pain across the front of the upper and lower jaws and above the eyes. Shoots of pain resembling tic, not always of great severity, darted about the eyes. They were intermittent, not occurring every day, but when she walked in a wind they became very intense, while the exercise of bicycling aggravated and changed their character to that steady beat and throb synchronous with the pulse, which is distinctive of pus-formation somewhere. From the fact that the six upper front teeth had all been extensively stopped, I suspected them, but the ordinary tests which are applied to dead teeth failed to fix any one of them in particular as being the cause. I asked the patient's permission to take a skiagram, but she demurred. I then explained that my only alternative was to drill into each tooth and test its condition near to or perhaps actually in the nerve chamber, and the needless pain which this proceeding would have entailed won her consent. The photograph revealed two dead teeth which were treated, with the result that her pain, neuralgia and throbbing, entirely disappeared. This slide illustrates well the diffuse form of dento-alveolar abscess.

FIG. VIII.—This slide is another case of similar character, also diagnosed by X-rays.

FIG. IX.—This next slide is of an upper left lateral incisor which gave rise to symptoms resembling the last case in the largeness of the area affected, and has a similar history of diagnosis, treatment and cure. It is a good example of a well-defined abscess. I might multiply such cases *ad infinitum*, but must pass on.

FIG. X.—This slide shows well the relation of the anterior upper teeth to the nasal fossa.

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THE TREATMENT OF IMPACTED AND INCOMING WISDOM TEETH.

Another pitfall for the unwary dentist is the incoming wisdom tooth. It may make its appearance at any age from fourteen to eighty-one years. It is one of the teeth which is supposed by evolutionists to be disappearing from the human dentition, and if the facts that in many mouths it is never erupted, and in many more is merely a rudimentary peg when it does come, are worth anything, they indicate that it is by no means a constant member. This being so, it will be seen that its very variable behaviour is a serious obstacle to diagnosis of pathological conditions to which it, in common with other causes, may give rise. From the age of eighteen years and upwards its eruption is usually slow and painful, and may cause at intervals trismus, glandular swelling, abscess, and severe constitutional disturbance which sometimes lead to serious consequences. Many of you will, no doubt, remember the death of Gwynne, at Singapore, about a year ago, from pneumonia, caused by the bursting into the lung of an abscess from an impacted wisdom tooth; and he is not by any means the only such case on record. Such extreme results are, happily, rare, but there are others of less severity which are bad enough to make their early diagnosis desirable.

This most erratic member, then, of the dental series is undoubtedly the *bete noire* of dentists. Besides its variability in size, shape, and time of eruption, it has been known to erupt at every point of the ascending ramus, from the angle to the condyle, not only inside the cavity of the mouth, but also outside on to the surface of the cheek, while its capacity for forming cysts of various kinds, innocent and malignant, is well known. The body

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of the lower jaw at the junction of the horizontal and ascending rami is at all times of life very dense, and comes next to the petrous portion of the temporal bone in opacity; while from twenty onwards its hardness increases with the age of the individual, till between thirty and forty-five the extraction of any tooth deeply embedded in it is, from this very density, a matter of very great difficulty indeed. In addition, there is the further difficulty that wisdom teeth at such an age do not often rise above the jaw sufficiently to afford a good grip in the operation for their removal. Need I point out what an inestimable boon in the treatment of this condition we have in the X-rays?

Fig. XI.—This slide represents very fairly a favourite position of the impacted wisdom tooth. Its anterior corner has caught against the back of the second molar, and the whole tooth has described a segment of a circle with that point as centre till the tooth, instead of pointing downwards, lies horizontally backwards.

This slide (not reproduced) shows rather an interesting incident of practice where the incoming wisdom simulated nerve inflammation and toothache from a filling. The patient came to have some teeth stopped, and among others the molar here was treated. A week or ten days later he returned, saying he had great pain in the tooth I had filled, and asked me to remove the filling and kill the nerve. I knew that the filling was not near the nerve, and could not possibly give rise to pain, and his age being about twenty, and the wisdom tooth not erupted, I diagnosed it as the source of trouble, and the patient departed, assured by what I had said. Three days later, however, he returned, and insisted I should remove my filling, but instead of doing this I took a skiagram which showed clearly not only that the incoming wisdom tooth was to blame, but

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that the filled molar was perfectly free from symptoms of irritation.

This slide (not reproduced) shows a case similar to the last.

THE NORMAL ERUPTION OF THE PERMANENT TEETH FOLLOWING THE TEMPORARY OR MILK TEETH, AND ABNORMAL ERUPTION OF THE SAME.

Perhaps the most useful function of the X-rays to the dentist is to demonstrate the order of eruption of the permanent teeth. Each of the temporary, or milk, teeth which are erupted from the sixth to the twenty-fourth month of extra-uterine life is followed between the sixth and twelfth years by a permanent successor. When these permanent successors fail to appear at their normal time the question arises, Why are they delayed? The most common of all causes are—(1) slow growth of the jaw, which is too small to accommodate them; and (2) retention beyond their normal period of the milk teeth, which obstruct the growth of the permanent set. In such cases the point to be decided as regards treatment is, shall the milk teeth be extracted? For example, when a child has reached ten years of age, and its milk molars are still *in situ* and show no signs of loosening and being shed, these teeth have been retained a full year beyond their normal term—that is, they should have been shed at nine years of age. Now, be it understood that in many people permanent successors to the milk teeth do not exist, and that, therefore, milk teeth are often retained and carried into adult life for an indefinite period. Here is a skiagram of the jaw of a man, aged twenty-two (Fig. XIII.), with his milk second molar still doing duty and no permanent tooth visible under it. There is another (Fig. XIV.) of a lady of thirty-three, showing a more markedly

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abnormal delay. Consequently, before extracting a milk tooth to make way for its permanent homologue, one must be sure that the latter is there to succeed. If it be not there you will, by extracting, stunt the growth of the jaw, to say nothing of robbing the patient of a useful tooth. Again, if the permanent successor be there, you must be sure that it is ready to come down, because if you extract before it is in course of eruption again you will check the growth of the jaw, and may suppress the very tooth which you wish to help through. Thus, before you proceed to extract a milk tooth to make way for a permanent one, you must be sure, firstly, that it is there, and secondly, that its eruption has so far advanced that it is ready to come down. It is in establishing these facts that the X-rays aid the dentist and enable him to grasp his opportunity at the moment when intervention becomes necessary.

FIGS. XII., XIII., XIV., XV., and XVI.—These slides will illustrate my meaning more clearly.

THE PROGRESS OF REGULATION OF THE TEETH WHEN THEY ARE MALPOSED ON ERUPTION, OR IRREGULAR IN THE JAW.

To illustrate this phase of the subject I shall cite one case. (FIGS. XVII. and XVIII.) These slides show the upper jaw of a child of twelve. You will notice that the left central incisor is twisted on its own axis in an angle of about 160 degrees, that this, the *inner* surface, looks outwards, and that this, the *outer* surface, looks inwards, and from this slide that it also lies at an angle of about 40 degrees to its normal upright position. The history is that this condition was caused by the presence of a supernumerary peg-shaped tooth, which for a long time was supposed to be the left central incisor malformed. It was only when the *normal* tooth began to force its way out that it became evident that the one occupying

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its place was an abnormality. When this was recognised the supernumerary tooth was removed, but, I regret to say, not in time to obviate the msichief it had occasioned. On its removal, however, the permanent incisor came down, and finally settled in this very bad position. The girl was an only daughter of wealthy parents, and they were anxious that the deformity should be corrected if possible. Several opinions were taken, one of which was that the tooth should be seized with a pair of ordinary extraction forceps and forcibly twisted into correct alignment. Among others, my friend, Dr. Stack, was not in favour of this heroic measure, and advocated slow rotation by means of a plate and springs, while he admitted at the same time that it would be a very hazardous operation and by no means certain of success, that, indeed, there was a strong presumption of the tooth's never being a useful member. At this juncture the X-rays were discovered (Fig. XIX.), and he had a skiagram taken, which showed that not only was the tooth abnormal in position, but, what was more serious, that its root was stunted and deformed so as to make its hold in the maxillary bone a very slender one. With fear and trembling he put his treatment into action, and in about three months' time the tooth was turned round to this position. At this point he unfortunatey became disabled, and the case came into my hands entirely. From this slide it will be seen that after the turning movement (Fig. XX.) had been effected it still maintained its oblique angle, and that as there was no bone between it and its neighbour, the lateral incisor, it was thus deprived of support in that direction, and that its socket was, therefore, besides being shallow and weak, incomplete and common to the said lateral incisor. Now, of all the front teeth, the lateral incisor is the one which most often goes wrong, nerve

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complications and abscess being more frequent in it than in any of the incisor teeth. The patient was very young, and it could by no means be said that her lateral incisor would never become diseased; and if such a thing were to occur the ill effects would most obviously be visited not only on it but also on the central incisor, with which it was in such close relation. Thus there were two excellent reasons why an attempt should be made to bring this tooth into line, the one that its socket was not an independent one, as it ought to be, and the other that, this being so, any possible infection of the lateral socket would probably lead to loss of the central as well, and this eventuality in a tooth of such feeble vitality was not to be risked if absolutely the best were to be done in the matter for the patient.

Now, to make a given tooth describe the segment of a circle through solid bone without the aid of gouge or osteotome is not to be undertaken lightly, and I accordingly asked the parents to take a second opinion. Mr. Dan Corbet, junr., was called in, and on consultation concurred that the possible risks of leaving the tooth as it was were greater than those to be run in treating it as I proposed, and, in short, he agreed with me. I then set to work, and by means of levers brought about the result which you here see. (FIGS. XXI. and XXII.) During the progress of the movement skiagrams were taken, and in each progress could be marked with no uncertain accent. In this (not reproduced) taken seven days after I had put on the appliance, you can see that pressure is causing absorption of bone at the point towards which force has been. This was a critical stage of treatment, for you can see that, deprived as the tooth was of all bony support, any untoward blow or incautious biting on the part of the patient would simply

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have knocked it out of her head. Any such accident, however, was safely weathered by the faithful care of the little lady herself, and at the end of five weeks the tooth had assumed its normal position. The retention of it there was simply a matter of bracing it to its neighbours until nature had deposited bone round it in such quantities as would hold it firm. Whether this has happened I leave you to judge from this slide. (Fig. XXIII.) The treating of this case, which, in the opinion of all dentists to whom I have shown it is unique, is pregnant with instruction. In the first place, had the X-rays been available and applied to the supernumerary peg-tooth at the date of its eruption the developing incisor would have been seen in the skiagram higher up in the body of the maxillary bone. We know that developing teeth can be thus seen years before their eruption. I believe that to the former—the supernumerary—was due the malformation of the root of the latter—the permanent incisor, which in its expulsion downward was caught between two forces acting against each other. Under such great pressure, firstly, the development of the part which was at the time in progress was bound to be arrested, and acordingly the root was stunted in size; and secondly, the tooth was compelled to escape from its crypt in the plane of least resistance, and appears as you see in this the first skiagram on a highly abnormal position. Unfortunately the X-rays had not been given to us at that time, and the opportunity of benefiting the normal incisor by extraction of the abnormal supernumerary was lost.

In the second instance, note with what certainty we were able to formulate a scheme and to adopt it; not on mere presumption or on speculative analogy was it determined that such and such should be done, but the inad-

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visability of leaving it untreated could be estimated, the advantages aimed at by treatment could be seen before their attainment was entered upon, and incidental risks guarded against. The necessity for each step was rendered clear as day not only to the dentist but to the patient's parents, to whom we are now able to say—Look at this skiagram (FIG. XXIII.) and see with your own eyes that success has followed our efforts.

TREATMENT OF DEAD TEETH.

There are many conditions of a nondescript character in which the X-rays are of service. In the treatment of dead teeth—for example, teeth in which the nerve or pulp has become putrescent—it is of importance that the central pulp canal of the tooth should be cleared out and thoroughly washed antiseptically, and that any abscess cavity connected with it should be drained and freed of pus in order that healthy granulations may grow into it, fill it up, and finally obliterate it altogether, as happens in the cure of abscess in any other part of the body. To attain this end, let me state briefly it is desirable that the length of the nerve canal should be sterilised, and so it becomes necessary to enlarge the canal by suitable breaches and drills till it can be freely entered to the apex of the roots.

In some instances it is an easy matter for the operator to be certain that he is at the end of the canal, but in many more this is by no means so simple a matter as it seems. Any twist or turn, any sudden narrowing of the lumen of the canal or the presence of an obstruction in it, may deceive the dentist into believing that he has traversed the entire extent when he has still some little distance to go before he reaches the end.

Now this little one-eighth or one quarter of an

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inch must be sterilised. The strength of a chain is the strength of its weakest link, and this is the weak link in the treatment of dead teeth; and it must be made secure, *firstly*, because through it the abscess has to be drained; *secondly*, because if this be not done the absorbent action of retained pus may eat the end of the root away and lead to loss of the teeth; and, *thirdly*, that no remnant of dead matter may be left in it to become a future focus of inflammation.

By inserting a metal pin into any given canal and taking a skiagram of it you can measure its extent with mathematical accuracy, because the pin is by this means portrayed in absolute relation to the tooth. In nineteen cases out of twenty, teeth X-rayed appear natural size on the photographic negative, and consequently so does the metal pin, and in the small number in which the image is incorrect any foreshortening or distortion can be readily recognised, and therefore need not lead one astray. Furthermore, even if the image be distorted, the image of the contained pin will also be distorted, and as there is always a constant proportion between the pin and the canal it occupies, their relation remains true. Thus if the skiagram shows that the metal pin does not reach the end of the root you have simply to take the pin, measure its length on the finest canal drill you have, add to that measurement the fraction which the photograph shows you were short, and sink carefully in the canal to the depth arrived at by the sum of these two measurements. I have never known this procedure to fail. You can if you wish demonstrate that you have attained your end by introducing another pin, longer than the first, into the canal and skiagraphing it in place, but so certain is the result of the first skiagram that I have never found this necessary.

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FIG. XXIV.—This case came to me with the request that I should crown this root. I opened up the canal in the ordinary way, but when I had got as far as I dared go I felt certain that I had not extirpated the entire pulp. I took this photograph, which showed my suspicions to be correct, and by following the method just described I was able to complete the treatment of the root satisfactorily.

FIG. XXV.—This case was one in which my course of root treatment was not giving satisfactory results, and while I was fairly sure of my ground I desired to exclude any possibility of a mistake. The photograph showed that I had reached the end of the root and that I had only to proceed as I was doing patiently and a cure would result in time. I am glad to say that it did come.

FIG. XXVI.—This is one like the last. Cure unaccountably delayed, but the X-rays showed I was proceeding on correct lines, which eventually gave the desired result.

FOREIGN BODIES IN THE ANTRUM OF HIGHMORE.

The last case (not reproduced) which I shall cite is one of a foreign body in the antrum of Highmore. It occurred in the Dental Hospital practice of one of my assistants. When the patient was examined a sinus was seen in the bicuspid region on the left side of the upper jaw opening into the mouth. It had been discharging for months. It had healed up from time to time, but as often as the patient caught cold his face swelled up and it burst again into his mouth, discharging a thin fluid. So far it resembled a chronic alveolar abscess. Careful probing elicited that it communicated with the antrum of Highmore, and in that cavity could be felt a small, hard body. A skiagram was taken by Dr. Haughton, and it showed the foreign body to be an incarcerated tooth which had been delayed in eruption from overcrowding, and had finally invaded the

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antrum. I cannot on this occasion enter further on the interesting points in pathology which this case calls up, but merely have to say that as soon as its presence and nature had been made clear by the Röntgen rays the foreign body was successfully dealt with, and in due time the opening healed up.

I must here apologise for the scrappy nature of my paper. It has been, I fear, nothing more than an epitome of cases treated which, while they may carry the conviction of experiment with them so far as they go, cannot claim to have exhausted the range of the subject. That the X-rays have become of the greatest importance to the dentist and his patient clinically I have endeavoured to show. In his daily practice they enable him to do three things—(1) To throw the light of visible fact on what was previously uncertain conjecture; (2) to establish points which but for their agency could not be established; and, (3) lastly, but not least importantly, to demonstrate these to his patient.

It is to be regretted that as all skiagrams lose *very much* in sharpness and accuracy of detail by all known processes of reproduction by printing, the accompanying illustrations do not show up so clearly as do the original negatives. This fact must be borne in mind when one is judging of their value.

George J. Goldie.

Before dealing with the practical application of X-rays in the examination of teeth, I desire to take this opportunity of expressing my sincere thanks to Dr. Theodore Stack and Dr. Goldie for their kindness in asking me to undertake the study of this special application of the

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X-rays and for the many opportunities they have afforded me for so doing ever since our first conversation on the subject early in 1896.

In a former communication before the Academy on the subject of X-ray work, amongst other applications in surgery and medicine I touched briefly on the following dental conditions:—

1. Normal eruption of teeth.
2. Abnormal eruption of teeth.
3. Caries.
4. Abscess.
5. Exostosis.
6. The study of the results of treatment.

Which conditions were illustrated by lantern slides.

Dr. Goldie has discussed in detail a much more comprehensive list of the applications of the process, from the standpoints of dental pathology, diagnosis and treatment.

From the very outset the study of its applications proved both interesting and fascinating, because the root and neck of an erupted tooth, or the root, neck and crown of an unerupted tooth, were objects more or less embedded in bone, invisible and intangible by any ordinary means of examination, which would not partially or completely interfere with the normal function of the tooth.

Here, then, the new light opened up a wide field for exploration, hitherto somewhat obscured by its anatomical surroundings, and one in which the results of examination by the new method seemed fraught with the possibility of many advantages both to the operator and patient.

How best to overcome the mechanical and physical difficulties in this method of exploration was the task before us.

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Among the preliminary obstacles met with may be mentioned the following:—

1. To obtain a photographic film which would accommodate itself to the varying curvature of the alveolar arch.

2. To enclose this film in an envelope impervious to ordinary light.

3. To protect this film in its "light-proof" envelope from the moisture of the saliva.

4. To obtain materials for these envelopes which would be permeable to X-rays, while impermeable to light and moisture.

5. Having satisfied the above conditions, to study accurately the best anatomical position in which to place the film so as to catch the X-ray shadow of that particular part of the tooth under immediate examination.

6. To obtain *a clamp* which would hold the film as rigidly as possible in the best anatomical position.

7. To maintain the patient's head at absolute rest.

8. To ascertain the best position and working distance of the X-ray tube with regard to the photographic film.

9. Duration of exposure.

10. Photographic difficulties of technique, such as special development for these films.

Last, and by no means least, to acquire a large *experience* of dental X-ray negatives, absolutely essential in this, as in all other branches of skiagraphy, for correct interpretation.

Glass photographic plates were first tried in the mouth, but these were soon discarded in favour of "*cut films*" for the following reasons:—In the first place, any glass photo plate in the market was too large for our purpose, and the difficulties of cutting down a glass plate to a small size in the dark room, without at the same time

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leaving indelible thumb and finger marks on it, were very great.

Glass, too, with its sharp angles, was very uncomfortable in the mouth, and, finally, it could not be bent so as to accommodate it to the varying curvature of the alveolar arch.

The "cut celluloid film" overcame most of these difficulties, as it was much easier to handle, and could be cut with ordinary scissors.

I may, perhaps, here be permitted to state that as a preliminary effort we tried to skiagraph the whole side of the upper or lower jaw at one exposure, by placing a plate *outside* the mouth, and getting the patient to lie with his cheek on the plate. This method presented many disadvantages. In the first place, if it be desired to produce a shadow of a tooth, giving its form, structure, and anatomical relations, with the minimum of distortion, it is necessary to pass the rays through the tooth at right angles to its long axis. Now, with the plate *outside* the mouth, the rays must first traverse the jaw bone and teeth in the side opposite to the one under examination, and so the shadow of the first side obscures and blurs the one under examination; while to escape the shadow of the unnecessary side, if the rays be passed *obliquely* through the open mouth from above, or through the floor of the mouth from below, the *obliquity* of the rays thus used produced too much distortion. Hence we were driven to devise some method of introducing a photo film into the mouth, and allowing the shadow of the tooth under inspection to fall on it. This method necessarily restricted the size of the film, and my practice now is to use one of small size, and only record three teeth at a time—*i.e.*, the tooth under examination and its two neighbours.

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Having got a suitable photo film, sensitive to X-rays, and flexible, our next object was to procure a "light-proof" envelope for it. This was simply done by constructing two small paper envelopes—an inner one of deep orange colour, and an outer of dense, black cartridge paper, glazed on the inside, so as to "felt" together the fabric of the paper, and thus diminish its porosity.

The next difficulty was to render the film, enclosed in its "light-proof" bags, safe from the moisture of the saliva. This was accomplished by using some form of India-rubber tissue. But here we were met by a new obstacle, because almost all samples of rubber are more or less opaque to X-rays, owing to the sulphur and other chemicals used in their manufacture. The first material used was ordinary white mackintosh tissue; this proved very opaque.

Next brown India-rubber thumb-stalls—the first lot being satisfactory, but not so later batches.

That fine sample of rubber used by dentists as a "rubber dam" for the mouth was next tried, but this proved more opaque than anything previously used.

Celluloid was also suggested, but the difficulty of ensuring waterproof sealing along the edges of the bag was very great. So, finally, a long correspondence with rubber manufacturers resulted in getting a special bag made of *almost pure* rubber which does not present very great opacity.

Next, the anatomy of the mouth claimed considerable attention; more especially regarding the relations of the root or roots, of each tooth, to the inner surface of the maxilla or mandible.

An accurate knowledge of these relations became necessary, in order to enable us so to place the photographic film as to catch the shadow of the roots under examination,

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without at the same time superimposing on their shadow those of neighbouring roots.

The curvature of the palatine surface of the maxilla, where the alveolus rounds off into the hard palate, is also very difficult to negotiate, and usually results in the following compromise:—

If the general curvature of the film, when moulded to the alveolar arch, be roughly estimated as making an angle of 45° with the axis of the root, then to maintain rectangular incidence of the rays on the film, they must be passed through the cheek from above at an angle of 45°.

A clamp to hold the film steady was very desirable. But amongst all the forms of mechanical clamp suggested up to the present, I have found none answer so well as the *finger* of a skilled and steady assistant, holding the film against the maxilla or mandible inside, with his other hand making counter pressure on the outside.

The patient's head is best controlled in the ordinary head-rest of a dental chair. The eyes being fixed on a suitable point in the line of vision, helps towards the same end, while the assistant's outer hand completes the fixation of the head as far as possible.

To ascertain the best position and working distance of the X-ray tube from film was purely a matter of experiment, based, however, on some previous experience of X-ray working. This is also true of the period of exposure necessary, which will, of course, in all cases depend on the X-ray tube's condition and the apparatus used. In general terms, young teeth require shorter exposure than old, and I have found 90 seconds to 2 minutes sufficient in most cases.

The contrast between alveolar and tooth shadow is also more marked in young mouths, and in adult life and old

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age the density of the angle of the lower jaw approximates to that of the wisdom tooth.

The incisors and canines are the easiest to skiagraph; while back molars are the most difficult, owing to the discomfort produced by stimulation of the fauces, and the unruly nature of the tongue in lower jaw cases!

The best working distance of the tube from the film I have found to be eight to ten inches. It is most important in dental skiagraphy to use a "tube" giving "sharp definition," else one loses a great deal of most valuable "detail."

In this, as in all other applications of the process for diagnostic purposes, a very considerable experience of X-ray negatives in general, besides an accurate knowledge of the anatomy and pathology of the parts under examination, is absolutely essential for correct interpretation.

William S. Haughton.

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EXPLANATION OF PLATES.

PLATE I.

FIG. I.—(*a*) Fractured root; (*b*) crowns of teeth in opposing jaw.

FIG. II.—View of model. (*c*) Fractured fragment of second molar buried in gum; (*d*) first molar; (*e*) third molar, or wisdom tooth.

FIG. III.—(c_1) Skiagram of fractured fragment of second molar in Fig II.

FIG. IV.—(*f*) Fracture in root.

FIG. V.—(*g*) Line of fracture in jaw. Note that the teeth are *not* in contact.

FIG. VI.—(*h*) Fractured stump, with nerve exposed. (Extracted.)

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PLATE I

FIG. I

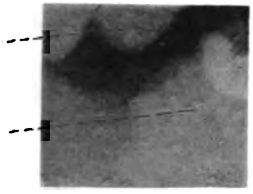

FIG. II

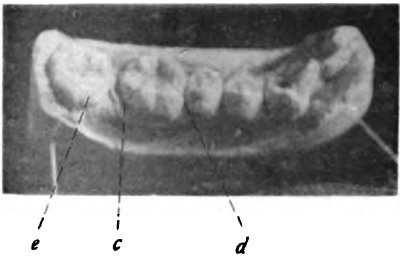

FIG. III

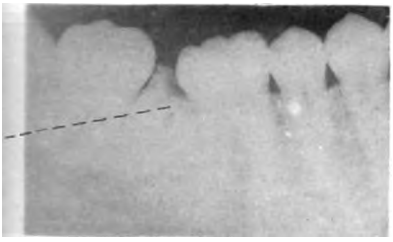

FIG. IV

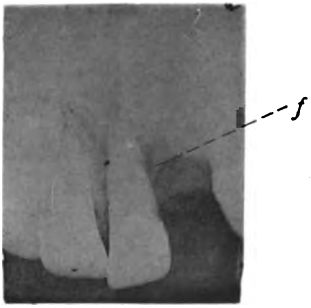

FIG. V

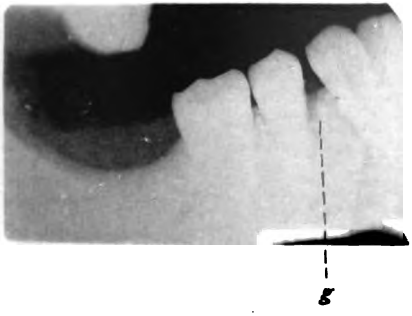

FIG. VI

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PLATE 2

FIG. VII

FIG. VIII

FIG. IX

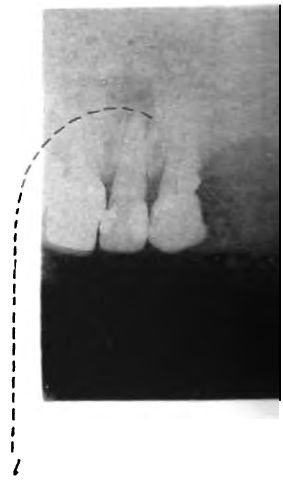

FIG. X

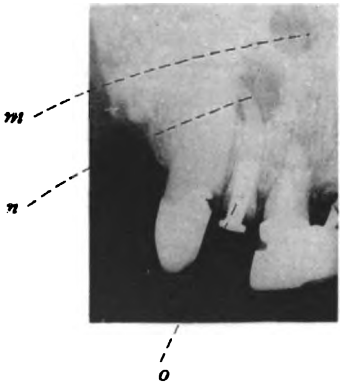

FIG. XI

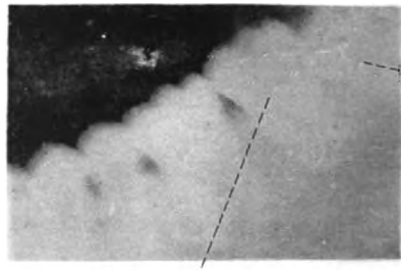

FIG. XII

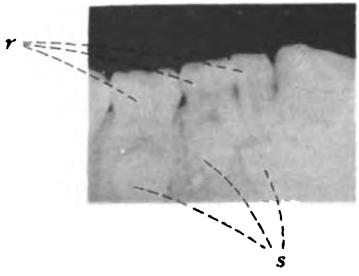

FIG. XIII

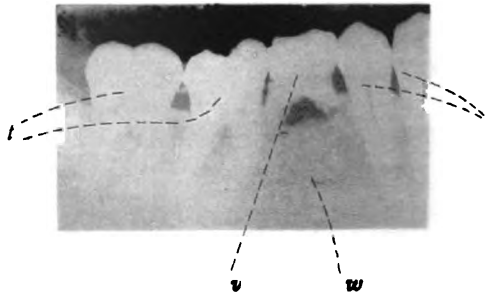

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FIG. VII

FIG. IX

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PLATE II.

FIG. VII.—Diffuse Abscess. Note area of absorption of bone at (*i*) (*j*) fillings.

FIG. VIII.—Note large area of absorption of bone at (*k*). Tooth was *very* loose, but recovered stability on treatment.

FIG. IX.—Note circumscribed abscess at (*l*).

FIG. X.—(*m*) Nasal fossa; (*n*) abscess cavity; (*o*) part of metallic crowning device.

FIG. XI.—(*p*) Second molar in lower jaw; (*q*) impacted wisdom tooth.

FIG. XII.—Good example of normal eruption—æt. 9 years; (*r*) milk teeth (*s*) crowns of permanent teeth developing in their crypts.

FIG. XIII.—Abnormality in eruption, patient aged twenty-two; (*t*) permanent first molar; (*u*) permanent first bicuspid and canine incisor; (*v*) milk molar retained to adult life; (*w*) empty crypt, showing no permanent successor to milk molar, hence retention of latter.

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PLATE III.

FIG. XIV.—Abnormality in eruption, patient aged thirty-three (*x*) permanent first bicuspid; (*y*) permanent first molar; (*z*) milk molar; (*i.*) empty crypt. (Case similar to Fig. XIII., but patient 11 years older.)

FIG. XV.—(*iii.*) Permanent tooth obstructed by (*ii.*) milk predecessor.

FIG. XVI.—(*v.*) Permanent tooth obstructed by (*iv.*) milk predecessor.

FIG. XVII.—(*vi.*) Outer surface of twisted and malformed incisor, looking inwards.

FIG. XVIII.—(*vii.*) Inner surface of same incisor, looking outwards.

FIG. XIX.—Skiagram of same incisor before treatment; (*viii.*) stunted root; (*ix.*) mechanical device for *slow* torsion.

FIG. XX.—Skiagram of same incisor after *slow* torsion had been performed; (*x.*) incisor in new position.

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PLATE 3

FIG. XIV

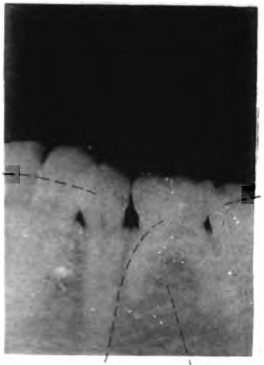

FIG. XV

FIG. XVI

FIG. XVII

FIG. XVIII

FIG. XIX

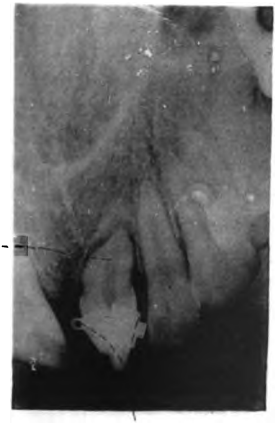

FIG. XX

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PLATE IV.

FIG. XXI.—Labial view of model of same incisor on completion o further treatment; (*xi.*) stunted incisor.

FIG. XXII.—Lingual view of Fig. XXI.; (*xii.*) stunted incisor.

FIG. XXIII.—Skiagram of same stunted incisor three months after treatment. Note how bone has been deposited at (*xiii.*) so as to form complete socket for this tooth. Compare with Figs. XIX. and XX.

Fig. XXIV.—Skiagram of root and metal measuring pin (*xiv.*) showing that latter *does not* reach the end of former.

FIG. XXV.—Skiagram of root, in which metal measuring pin (*xv.*) *does* reach the end.

FIG. XXVI.—Case similar to Fig. XXV.; measuring pin (*xvi.*).

FIG. XXVII.—Shows method of marking on drill (*xvii.*) depth to which measuring pin (*xviii.*) has been sunk. (See text.)

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CANCER OF THE GALL BLADDER.

By E. J. McWEENEY, M.A., M.D.

[Exhibited at the Pathological Section, March 22, 1901.]

The interesting feature in this specimen was the squamous character of the cancer cells, which was in some places so pronounced as to give rise to histological appearances resembling those of squamous epithelioma.

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TUBERCULAR PERICARDITIS.

[Read in the Section of Pathology, May 3, 1901.]

DR. DEMPSEY described the interesting clinical details. P. D., a dairyman, was admitted to the Mater Misericordiæ Hospital on February 15, complaining of some pain at the lower part of the sternum, and of cough. Patient is a well-nourished man of good physique; no personal or family history of rheumatism; both parents alive and in good health. The present illness commenced a week before admission rather suddenly, with shivering, pain in head and back. On admission—Pale face, but no cyanosis; breathing somewhat hurried, 24 to the minute; pulse, 108, regular, fairly strong; temperature 101°; heart's impulse invisible, and its sounds weak, especially at the apex. Along the left edge of the sternum a loud and very rough to-and-fro friction sound was distinctly heard. The area of the heart dulness extended in the upward direction to the upper border of the left third rib, to the left just beyond the nipple line, and in the opposite direction to the right edge of the sternum. The lungs, which were emphysematous, seemed otherwise normal. The urine contained no albumen. During the first fortnight his condition showed little change beyond an increase in the area of dulness, which, maintaining its triangular shape, reached upwards to the second rib, and broadened about an inch laterally in each direction. The pulse, though frequent (100-120), remained regular, and of fair strength. The friction rub still persisted. At this time a soft semi-elastic swelling, not distinctly pitting on pressure, appeared in front just above and below the right

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clavicle. The swelling gave rise to some pain, but gradually lessened, and had disappeared in four or five days. Four weeks later fluid had accumulated in the left pleura, reaching nearly to the angle of the scapula, and as the withdrawal of this gave no relief, the breathing laboured, and the pulse rapid and irregular, it was determined to evacuate the pericardial fluid. Accordingly, on the 14th of March, my colleague, Mr. Hayes, operating, the fifth left intercostal space was incised, B. eucaine previously injected, the internal mammary vessels tied, the pleura pushed aside, and the pericardium incised, and about 50 oz. of clear fluid evacuated. A little of the latter, collected in a sterilised tube, was subsequently found to contain the tubercle bacilli. After the operation the patient felt much relieved, but on the evening of the same day died rather suddenly.

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THE NAKED-EYE AND MICROSCOPIC ANATOMY OF A CASE OF TUBERCULAR PERICARDITIS.

[Read in the Section of Pathology, May 3, 1901.]

Dr. M'Weeney gave an account of the pathological aspect of this case, the clinical details of which had already been communicated by Dr. Dempsey. He had been greatly interested by finding in the scanty sediment obtained by centrifuging the fluid collected at the operation, a poly-nuclear leucocyte, containing about six distinct tubercle bascilli in two groups of three lying on each side of the nuclei. These were the only bacilli to be found in the whole preparation, and had enabled him to make the diagnosis *intra-vitam*. He then detailed the *post-mortem* appearances as follows:—The parietal pericardium was greatly thickened. On section a thin white line could be seen, corresponding to the original position of the serous membrane. Inside of this was a newly-formed layer of tissue, in which small areas of caseation could be made out with the naked eye. The outer surface showed here and there miliary tubercles; these were especially prominent and numerous at the back near the middle line. The inner surface was rough and shaggy from adherent fibrinous exudate. Under the microscope the parietal pericardium showed:—

1. An outside layer, consisting of bundles of white fibrous tissue, running parallel to the surface. Between the bundles were rather more cells than usual, and the tissue was decidedly œdematous. This part corresponded to the original pericardial membrane.

2. Internal to this was a layer of what might be termed germinal tissue, consisting of small uninucleated cells, and oval or elongated "fibroblastic" cells, together with numerous thin-walled blood-vessels, all being evidently of

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new formation. Scattered about in this tissue were single giant-cells, giant-cell systems, and caseous areas devoid of giant-cells, the whole being perfectly characteristic of a somewhat chronic tuberculous process. There were in this tissue two other features worthy of note:—

(*a*) Thrombosis, with organisation of the thrombus, in several of the small blood-vessels, the lumen being partly filled with structureless fibrin, and partly with fibroblasts; and

(*b*) The presence between the various tissue elements of hyaline masses of irregular shape. They often lay in empty spaces, were abundant near the caseous areas, and on close examination appeared to represent the corpuscular contents of small blood-vessels which had undergone disintegration and hyaline degeneration owing to the presence of the tubercular toxin in their neighbourhood. Many of the more irregularly-shaped hyaline masses were evidently due to the degeneration of masses of effused red corpuscles.

In the caseous areas, but not in the giant-cells, tubercle bacilli were present, though somewhat sparingly. The visceral pericardium was also greatly thickened, in some places attaining half an inch in thickness. It was everywhere covered with a thick whitish layer of fibrinous exudate, and presented numerous bright red hæmorrhagic areas, some of which were as big as a half-crown. On section it was thickly studded with minute tubercles and caseating areas. The microscope showed—(1) a layer of loose, sparsely cellular connective tissue with large vessels, in contact with the myocardium; (2) a layer of small round cells of lymphoid aspect.

3. Superficial to this, a layer of tubercular granulation tissue, similar to that already described in connection with the parietal pericardium. The giant-cell systems were

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larger and more numerous, however. The caseous areas were always encircled with a ring of fibroblastic elements.

4. Most superficial of all was a layer of fibrin which was quite structureless and devoid of cells, save at the extreme periphery, where it contained a number of degenerate cells, seemingly polynuclear.

Tubercle bacilli were demonstrable in the caseous areas and in the superficial layer of the fibrinous part, but were nowhere abundant. A few giant-cells also contained them. The hæmorrhagic spots above alluded to were shown to contain a surprisingly large number of thin-walled vessels of new formation, some of which had ruptured. The vascularity of some of the superficial parts of the tubercular granulation tissue was highly remarkable. Sections from a piece of sub-epicardial fat from one of the auricular appendices showed numerous minute tubercles, each consisting of a single giant-cell system embedded in a highly vascular round cell granulation tissue. The tubercular process was beneath the epicardial endothelium, and superficial to the fat cells.

The *right* lung presented nothing remarkable save a small outbreak of miliary tubercles on the posterior surface, all of them lying on the pleura. The *left* lung was collapsed and almost airless. The posterior aspect of the pleura, its diaphragramatic surface, the adjoining surfaces of the lobes and the tissue between lung and pericardium were thickly studded with miliary tubercles. On section the collapsed pulmonary parenchyma was seen to be studded with extremely minute tubercles, scarcely visible to the unassisted eye, and evidently of recent origin. The microscopic examination of the pleura showed the minute tubercles to consist of small areas of caseation, surrounded by fibroblasts. They were embedded in a sort of fibroblastic granulation tissue, which also contained giant-cells. Newly-formed blood-vessels were *not* a marked

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feature of this material, and tubercle bacilli were not seen. They must certainly have been very scarce. The sections also showed much œdema of the collapsed lung. Microscopic sections of the adjacent surfaces of the pleura and pericardium, showing the intervening tissue, including the phrenic nerve, were also made. The pericardium was thickly studded with minute tubercles, densely infiltrated with small cells, and the intervening space was filled up partly with adipose tissue and partly with a reticular network of fibrin. The branches of the phrenic nerve, 8 in number, did not present a very typical appearance, axis cylinders and myelin sheaths being only recognisable with difficulty. A caseous and broken-down lymphatic gland, about as big as a bean, was found in the posterior mediastinum close to the convexity of the aortic arch, to the left of which it lay in close contiguity to one of the pericardial arteries. It is to this gland, or perhaps from a similar one left behind at the autopsy, that the infection of the pericardium is in all probability to be traced.

PROFESSOR O'SULLIVAN said the two cases of tubercular pericarditis which he had seen differed from Dr. Dempsey's in having absolute adhesion of the pericardial layers together and no fluid. They must all have wondered, from time to time, at the small number of tubercle bacilli found in such cases. Two cases in which he had found tubercle bacilli in large numbers were very rapid infections of the lung. One case was a universal infection and rapid death in a child. To the naked eye the whole lung was practically solid, and on section showed an almost entirely serous exudate in the alveoli. The other was a case of caseating pneumonia which spread over the lung and caused death quickly These cases went to show that in the more chronic cases the bacilli must have been present, and in the later stages must have ceased to be capable of staining. It was quite inconceivable that such huge alterations could have been caused by the few bacilli found.

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SECTION OF STATE MEDICINE.

COMPULSORY NOTIFICATION OF TUBERCULOSIS.

By SIR CHARLES A. CAMERON, C.B;
Professor of Chemistry, Royal College of Surgeons;
Superintendent Medical Officer of Health, City of Dublin.

[Read in the Section of State Medicine, February 15, 1901.]

THE contagious nature of tuberculosis of the lungs is now universally admitted. In the Schedule of Infective Diseases in the Contagious Diseases Notification Act the greater number of the commonly occurring maladies of that group are included. Provision is made for the inclusion in the schedule of such other infective diseases as the Sanitary Authorities may, with the sanction of the Local Government Board, determine. The Corporation of Dublin have made measles a permanently notifiable disease, and other diseases, such as diarrhœa and cerebro-spinal meningitis, notifiable for limited periods.

In December last the Public Health Committee recommended the Corporation to add tuberculosis of the lungs to the schedule of notifiable diseases. After a debate the further consideration of the proposal was adjourned for six months in order that more information in reference should be obtained by the Public Health Committee and submitted to the Corporation. On inquiry at the Local Government Board for England I learned that several sanitary authorities had applied to that Board for permission to make tuberculosis compulsorily notifiable; the

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Board did not, however, give the required sanction. It is unlikely that the Irish Local Government would have acted differently had the Dublin Corporation adopted the Report of the Public Health Committee recommending compulsory notification.

Voluntary notification of tuberculosis exists in several English towns, and payment is made for the notifications. There is no available fund in Dublin, or probably in any other Irish town, for such a purpose. The Borough Fund in Dublin has charges upon it which, when satisfied, leave no surplus. If there were a surplus it could be devoted to any purpose for the public good in the discretion of the Corporation. In short, many English and Scotch towns have funds which enable payment to be made for voluntary notification, whilst the Dublin Sanitary Authority could only pay for compulsory notifications. It was with this inability in view that the Public Health Committee recommended compulsory notification as the only kind that could be paid for. It seems likely, however, that the Corporation could legally pay medical men for notifying infectious diseases if they used the provisions of the Public Health Act, 1878.

As to the desirability of making phthisis notifiable opinion seems to be divided. It has lately been made compulsorily notifiable by the Norwegian Legislature. In some of the United States it is notifiable; for example, Michigan and New York. According to Dr. Hermann Beggs, notification of tuberculosis has reduced the mortality from that disease in New York City 35 per cent. since 1886.

The objectors to notification say that it would cause great inconvenience to the patients and their families; that attempts to isolate them would be made which, if successful, would cause expense that might not be readily

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borne; that poor persons would resent interference with them; that phthisical patients would be prosecuted if they went into tramcars or railway carriages; that physicians would be at a loss to know at what stage of the disease they should notify; and so on.

If compulsory notification were adopted the sanitary authorities would not surely regard a person affected with tuberculosis in the same way as they would a person suffering from smallpox or scarlet fever; the former would not be compelled to be isolated in the same way as the latter are. They would certainly not be prosecuted for appearing in public, as has been argued would be the case. The initiative in cases of prosecution for the exposure of a person suffering from a contagious disease is taken by the Sanitary Authority, and in the case of consumptives no such action would be taken.

The advantages to be derived from notification are as follow:—

1st. Useful information could be supplied verbally, or by means of printed leaflets, to patients and their families or associates dwelling in the houses liable to sanitary inspection; the importance of keeping the affected persons as far as practicable from those who were in health could be indicated; the highly infectious nature of the sputa of the consumptives and the precautions to be taken as to disposal of them could be pointed out.

2nd. In the case of the poor, receptacles for sputa and materials for disinfecting them might be supplied by the Sanitary Authority.

3rd. Amongst the poor there is frequent change of residence. It very frequently occurs that rooms recently vacated by consumptives are immediately re-occupied without having previously been disinfected. This would not be possible if there were notification, for the Sanitary

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Authority would require the landlords to notify the vacation of rooms occupied by consumptives.

The principal objection to notification is the difficulty in determining the proper time to notify. I think cases should not be notified unless the physical signs of phthisis are unmistakably present, or that the bacilli of tubercle has been detected. I trust that, should notification become compulsory in Dublin, facilities will be given to practitioners to have bacteriological examinations of sputa made free of charge. Let us hope that by the establishment of the proposed Jenner Institute in Dublin this desirable state of things will come to pass.

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OUR MEAT SUPPLY AND HOW TO IMPROVE IT.

By HENRY O'NEILL, M.D.,
Consulting Surgeon, Royal Victoria Hospital, Belfast.

[Read in the Section of State Medicine, February 15, 1901.]

Please accept my sincere thanks for the kindly courtesy shown in giving me this opportunity of drawing your attention to our meat supply, and how it may be improved. To my friend, Dr. Ninian Falkiner, your energetic secretary, is especially due my presence here to-night. I have listened with much pleasure and interest to the paper just read by my friend, Sir Charles Cameron, and cordially agree with him in the importance of having the Notification of pulmonary tuberculosis compulsory, as a means by which we may lessen and eventually remove this disease which is a scourge to our modern civilisation. To the industry and zeal of Sir Charles Cameron the citizens of Dublin owe a deep debt of gratitude. Since he became Medical Officer of Health his efforts have been constantly directed for the happiness and welfare of the citizens.

Having recently visited several German and French cities, and the chief cities of Great Britain, I have made myself familiar with the various methods adopted by these cities, by which they insure to their citizens a supply of sound meat, which, when examined, as is the rule in the principal Continental cities, is stamped. This method of inspection is so complete the people there enjoy a freedom from this source of contagion which our people in this country up to the present do not to the same extent enjoy.

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MEAT INSPECTION IN BELFAST.

Meat inspection in Belfast is conducted under the control of the Market Committee of the County Borough, by the Inspector of Meat and Provisions. The staff consists of one Superintendent of the Public Abattoir and three practical Meat Inspectors. When any doubt arises as regards the condition of the meat inspected, there is a consultation held with a veterinary surgeon and such other experts as the Market Committee may consider necessary.

The powers of these Meat Inspectors are defined by Clauses 116, 117, 118, and 119 of the Public Health Act, 1875, and the Belfast Borough Act of 1845.

Each Inspector of Meat and Provisions has been thoroughly trained in the slaughtering of animals, the preparation of meat intended for human food, and the characteristic appearance of

1. Diseased meat.
2. Meat from animals dying through accident.
3. Putrid meat.
4. Physicked meat.
5. Dysentric meat.
6. Fishy meat.

It is equally his duty to prevent sound meat from being destroyed, as it is to see that all unsound meat is promptly destroyed.

It is well known that large quantities of diseased meat are sold for human food, and especially by the poor is this unsound meat purchased and used, as they have not always the means of knowing sound from unhealthy meat, when the latter has been skilfully prepared by dishonest butchers for the purpose of making money at the expense of the health of the public.

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Much diseased meat is taken to manufactories, where various kinds of minced meats are made, such as German sausages, pork or meat pies, brawn, &c., highly seasoned to cover any imperfections in quality.

Diseased meat, as a rule, may easily be detected—1st. By wetness of the flesh, which is of a pale colour, with enlargement of the kidneys. 2nd. By a red surface, with dark sticky flesh, and the kidneys dark and congested.

Sound healthy meat is of a bright cherry colour, the outer part of the carcase being of a deep purplish red, the belly being clear and free from adhesion, with pink ribs; the fat firm, and of a pale straw colour.

In young animals there is a cartilaginous condition of the vertebræ, each joint when opened is of a bluish colour, with porous bones; while in the carcases of old animals the vertebræ and pelvic bones are brittle, and the flesh is harsh and dry, with little nourishment as food.

When meat has been inspected and found to be unhealthy, the Public Health Act of 1875 enacts that it can be condemned, and should not be exposed for sale or sold for human food. (See Clauses 116, 117, 118, and 119.)

Care is taken that meat fit for human food is not destroyed, and, as a rule, where inspection is conducted, judgment is given after the carcase has been hung up for at least twelve hours.

To decide the quality of meat on alone inspecting the viscera and lungs would be misleading, and unjust to the owner.

Tuberculosis in meat has been a long time recognised, and is called by the butchers "grapy," from the fact that clusters of tubercles adhere to the pleura and peritoneum resembling grapes. This is mostly seen in old cows.

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Foot-and-mouth disease causes meat of an animal so affected to be highly dangerous, and should be destroyed.

Milk fever is the cause of dangerous disease in meat, and should always be destroyed.

Rinderpest or murrain is a severe form of disease, and may be conveyed to man by eating of food so affected.

Anthrax is a highly contagious disease affecting the tongue and adjacent parts, and may affect any human being who comes in close contact with the animal.

Cancer of the jaw is sometimes found in cattle, and renders the meat dangerous to human life.

Refrigerated American-killed meat is of good quality, and is largely sold as prime Scotch beef. The good points about American-killed refrigerated meat are—1st. Breed, principally Hereford, Norfolk, and Scotch. 2nd. Youth, as the animals are mostly between three and four years old. 3rd. From birth they are well fed and well attended to.

Horses, when disabled for work, are sometimes sold for human food.

Measles are common in Hungarian and Irish bred pigs. The meat of such pigs is highly dangerous.

Putrid meat should be at once condemned. Some men expose meat for sale regardless of the effect upon the human body.

At Leadenhall Market a hamper of carcases of animals was found, containing unborn lambs, dressed like Ostend rabbits. A retriever dog was killed and dressed as a lamb; the owner was convicted, and got three months' imprisonment. At the Central Meat Market, London, parts of a donkey were dressed, and exposed for sale as home-fed deer.

On the 1st September, 1900, there was submitted to the Market Committee a report on Meat Inspection, as con-

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ducted by the Municipal Corporation of Paris, Berlin, London, and Manchester. On the 15th of September, 1900, this report was considered, and was adopted and entered on the minutes, and the following resolutions were unanimously adopted:—

Resolved—"That our Inspectors be instructed to stamp each carcase of meat passed by them as fit for human food, if the owner consents to their doing so."

Resolved—"That the Council be recommended to pass a bye-law to the following effect":—

"'That all meat killed outside the City, and brought into the City for sale, shall, before being sold or exposed for sale, be brought into a Market, to be appointed by the Council, for inspection by one of their Inspectors of Provisions, between the hours of 8 and 10 a.m., and shall not be sold or exposed for sale until after same has been inspected and passed by him as fit for human food. Penalty not exceeding 40s.'"

These resolutions were confirmed on Monday, 1st October, 1900, by the Corporation of Belfast.

This bye-law was approved of by the Local Government Board on Saturday, the 9th February, 1901. The urgent necessity for this bye-law was admitted by our more intelligent citizens when they learned cattle affected with disease were killed outside the city, brought into it, and sold without proper inspection. The Corporation had power to inspect the slaughter-houses in the city, and all meat killed in the public abattoir was so inspected, but much less efficiently so in the private slaughter-houses than was desirable. It was ascertained that in the year 1897 125 carcases were seized in the public abattoir and condemned as unfit for human food; in 1898, 127; in 1899, 175; and in 1900, 253; making a total of 650 diseased carcases seized, of 128,649 cattle killed in the

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Belfast Public Abattoir in the four years 1897-1900. Whilst in the private slaughter-houses there were no cases in 1897, 1 in 1898, 3 in 1899, and none in 1900, making a total of 4 diseased carcases seized in the private slaughter-houses in four years—1897-1900. In the shops were seized—in 1897, 9 diseased carcases; in 1898, 20; in 1899, 11; in 1900, 2; total in four years, 43.

ADVICE TO OUR CITIZENS IN BELFAST.—Before purchasing meat from your butcher, ask to see the mark of the Meat Inspector's Stamp on it. When the meat has been stamped the purchaser may be certain that, under the direction of the City Corporation of the County Borough of Belfast (the first City, we believe, in the British Isles to adopt a scientific method of such Inspection of Meat), it has been carefully examined, and declared sound and fit for human food.

PARIS.

In Paris a strict method of inspection is adopted in the examining of all meat brought to the city, whether killed at home or foreign, and when the meat is found to be sound is stamped with a stamp bearing the signature "P.P.," which means Prefecture of Police.

At the International Congress of Hygiene and Demography in Paris, 1900, the following resolutions were passed:—

"That all tins containing preserved meat, fish, &c., should bear the date of their manufacture; and that rules for the preservation of food in tins should be published and distributed among all persons engaged in the trade.

"That no chemical should be employed for the preservation of food.

"That the inspection of meat should be enforced, and

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the methods of control assimilated in all countries. It was recommended that an International Congress of Veterinary Surgeons and others should meet for this purpose, so as to establish a basis for uniform teaching in all countries as to the methods of controlling the meat supply.

"That there should be public slaughter-houses in all large centres. That small centres should federate so as to have one public slaughter-house between them.

"That where it was absolutely impossible to have a public slaughter-house, the killing in private slaughter-houses should only take place at fixed hours, and should be under the control of the Local authorities.

"That inferior but wholesome meat might only be sold in especially indicated localities, and Inspectors should have the right to visit all such places, both day and night."

BERLIN.

In Berlin all cattle to be offered for sale in the city must be brought to the Public Abattoir, and the slaughtering of cattle anywhere else in the Municipal Boundary is absolutely forbidden.

All dead meat, slaughtered in the country or abroad, and intended for human food in the city, must be brought to the Public Abattoir and Meat Market for inspection before being offered for sale as human food. No butcher in Berlin may offer meat for human food which does not bear the Official Stamp of the Inspecting Department of the Central Market. About 1,100,000 animals are slaughtered annually in Berlin.

The Chief Inspector of Meat is a thoroughly qualified Veterinary Surgeon, and has under his control a large staff of surgeons, assistant-surgeons, special inspectors, and stampers.

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As a result of this method of thorough inspection, as conducted under the control of the Municipal Corporation of the City of Berlin, a person may purchase meat from any butcher's shop in the city, and feel certain the meat has been carefully inspected, stamped, and officially declared fit for human food.

The cattle dealers and butchers of Berlin appear to be well satisfied with the working of the present system of meat inspection, and would not care to have a less stringent measure adopted.

CITY AND COUNTY OF LONDON.

In the City and County of London I found the sources of the meat supply, and the manner in which the meat is inspected, to be as follows:—

At the present time meat is received by retail vendors in London from four sources—

1. From the Smithfield Meat Market, where it is inspected by the officers of the City.

2. Direct from the Foreign Cattle Market at Deptford and from private slaughter-houses in the Islington Market, without passing through the Smithfield Market. This meat is not systematically inspected.

3. From the country, whence carcases are sent direct to meat vendors in London. This meat is not inspected before being conveyed to the vendors' shops.

4. From private slaughter-houses in London. This meat is, in practice, only occasionally inspected in the slaughter-houses.

The incomplete inspection of meat, as at present conducted, is not considered satisfactory by the Public Health Committee of the London County Council, and an improved method is at present under consideration so that

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all meat brought into London, for use by the citizens as human food, should be properly inspected and stamped.

The duty of every community is to ensure, as far as practicable, by the provision of public slaughter-houses, the proper inspection of all meat killed within its area.

MANCHESTER.

In the City of Manchester the method of meat inspection in the abattoir and meat market is conducted much in the same manner as in the City of London. There is not a complete inspection of all meat brought into the city for human food, and the meat which is inspected is not stamped.

So far as England is concerned, with regard to the inspection of meat, and the mode of destroying seized or condemned meat, Dr. Sedwick Saunders, the Medical Officer of Health for the City of London, in a report on the better inspection of meat there, states:—

"The principles which govern the seizure and destruction of meat actually diseased from constitutional, parasitical, specific, endemic, or sporadic causes are immutable, being founded upon fixed laws of pathology as old as Hippocrates, and all the special pleading of graziers, butchers, and their abettors cannot, and should not, prevail against the practical and wide experience of officials whose plain duty is to protect the public from the consequences of eating meat charged with pathogenic microbes, irrespective of the pecuniary losses to those whose goods are sacrificed."

"To obviate any possible misconception on this point it must be clearly understood that under no circumstances, not from any quarter, in spite of the certificate of a veterinarian, will tuberculosis meat be passed by myself, or inspectors, at any of the dead meat markets within the

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jurisdiction of the Corporation of London, and further, that any person, irrespective of his rank, attempting to poison the public with such stuff will be prosecuted and rendered liable to fine or imprisonment."

APPENDIX.

THE "PODEWIL'S" SYSTEM FOR THE STERILISATION OF DISEASED MEAT.

This is a modern, efficient method for the sterilisation of diseased meat, so as to render it innocuous, and for extracting from the meat the fat and nitrogenous matter.

The apparatus is of simple construction, acts automatically, and performs all the various processes connected with the working up of a diseased carcase in a sanitary and economical manner.

In applying the Podewil's apparatus at the abattoir there will be much saving of money to the butchers, meat salesmen, and farmers, which at present is lost, and which presses heavily on many poor men who can ill afford it. At the same time the public health of the citizens will be safeguarded from the danger of eating diseased meat.

Many of your readers may not know the present state of the law as regards the seizure and destruction of meat intended for the food of man when found affected by tuberculosis, anthrax, and other forms of contagious diseases. The carcase when found on careful inspection to be so diseased is seized by the Meat Inspectors of the City Corporation (the administrators of the Public Health Acts), who, as a rule, apply to the City Magistrates for an order for destruction of the diseased meat. When the carcase has been destroyed there is not any compensation for loss of the meat given to the owner, who is often fined for having possession of the carcase, which he believed when purchasing same was sound and healthy. This meat

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is destroyed so as to prevent the spread of tuberculosis or anthrax to human beings who eat meat so affected, and is a wise regulation for the benefit of the public health. But why should the public receive all the benefit while the farmer, butcher, or meat salesman who owned the animal which he bought as sound and healthy be at the entire loss of the affected carcase which was only found diseased after the animal was killed; and often such disease in the living animal cannot be observed even by skilled inspectors and veterinary surgeons. When an animal found suffering from a form of contagious disease called foot-and-mouth disease, the same City Corporation officials who administer this form of Contagious Disease in Animals Act seize the animal and destroy it, but compensate the owner for the loss he sustains for the benefit of the public health? Will any of my intelligent audience inform me why the owners of the carcases seized and destroyed because affected with tuberculosis or anthrax is not compensated, while, if he owns a beast affected by an equally contagious malady, foot-and-mouth disease, the carcase is seized and destroyed, while the owner receives compensation for the loss of the animal, and receives the gratitude of the public for his action in reporting the disease to the inspector? What is the remedy for this unsatisfactory state of the law?

"The Local Government Board of Ireland be recommended to schedule tuberculosis and anthrax in cattle with foot and mouth disease." So that when meat affected with tuberculosis or anthrax is seized and destroyed the owner may be compensated for his loss, the same as he, by law, would be compensated for the loss sustained by him had his beast been affected by foot and mouth disease.

On the 2nd October the Corporation of the County

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Borough of Belfast sanctioned a recommendation of the Markets Committee of the 15th September, 1900, and resolved—"That until the erection of the new abattoir the Market Committee of the Corporation take the necessary steps themselves to destroy all carcases (condemned as unfit for human food) and secure the turning to useful purposes of such portions of the carcases as may not be used for human food. That Councillors Corr, Macartney, and M'Innes, with the Clerk of Markets and Assistant Surveyor, be appointed as a deputation (as sanctioned in Council on 2nd inst.) to visit such cities and towns as may be considered desirable, and examine the system in force for the inspection of meat, &c., intended for human food, also the plant, &c., used for the destruction of carcases condemned as unfit for human food, and to prepare and submit a report, giving particulars of what they consider the most suitable arrangements for Belfast, and the probable cost of the necessary buildings, plant, and fittings." The report on the subject has since been presented to the Market Committee, and adopted by the Corporation. An installation of Podewil's Apparatus is about to be erected in Belfast.

The following discussion took place on the two preceding papers by Sir Charles Cameron and Dr. Henry O'Neill:—

Dr. A. Roche said as regarded compensating butchers for confiscated meat, other traders, if they sold either adulterated or injured food, were made responsible, and he saw no reason why an exception should be made in favour of butchers. If a butcher could show that he had bought the animal in good faith as a healthy ainmal, the person who sold it should be held responsible. It would be an enormous tax—and, to his mind, an impossible tax—to make the public pay two-thirds of the value of all cattle found to be diseased. A serious objection to private slaughter-houses was that they were not alone a grave nuisance in the

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neighbourhood, but they had a bad moral effect. There was not so much jerry-building in Dublin as in Belfast, but the sewerage system in Dublin was very defective, as regarded not alone the mains, but also the house drains. Instead of being at the back or in the garden the privies were under the houses, and the whole subsoil was one vast cesspool. Some time ago he was about taking a house in St. Stephen's-green, but he found the house drain ran under the kitchen, and there was an interval of a foot between some of the drain-pipes. When that occurred in the squares it must be frequent in the tenement houses; and in many of the old tenement houses to save the expense of having a watercourse for each house the drains were run obliquely, and in laying down the new water closets they did not insist on their being connected with the main sewer, so that the sewage of two or three other houses came to one house. Again, in areas where trough closets were laid down—as, for instance, around the Four Courts—it was quite possible for the water supply to become contaminated with gas, if through any carelessness the taps were left turned on. In addition, the system of disinfection in many Dublin hospitals was extremely defective. When he investigated the subject seven or eight years ago he found there was practically no disinfection in some hospitals. All this accounted for the fact that there was practically no fall in the death-rate from typhoid fever in Dublin.

Dr. Potter said he was public medical officer in Bengal for 30 years, and phthisis was practically unknown. The natives in India invariably boiled the milk before using it, and he believed that had a good deal to do with the prevention of phthisis.

Professor Mettam said the inspection of animals, both alive and dead, should be placed in the hands of the veterinary surgeon. The system of meat inspection in Berlin was the best in the world, because it was in the hands of the veterinary profession. As regards the question of compensation, if a butcher bought an animal in the belief that it was healthy, and afterwards found it unfit for food, he should be compensated either by the local authority or the county, or the Government. But if a man bought a cow at a price manifestly below the market value of meat fit for human food he deserved to lose.

Mr. Watson said he did not claim that the Dublin dairy cattle were free from tuberculosis, but it did not prevail to anything like the extent popularly believed. The scheduling of tuber-

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culosis was a very serious matter to tackle, from both the monetary and other points of view. Dr. O'Neill's plans, if he understood them aright, would only destroy the large amount of good that could and would be done by moderate means.

Dr. Delahoyde did not think it quite possible to carry out a system of notification of tuberculosis. A rigid system of meat inspection was wanted in Dublin. Taking into account the size of the city the dairy cattle in Dublin ware remarkably free from tuberculosis. He thought there was too much jerry-building in Dublin. He had reason to know that some houses in one region of Dublin were insanitary three months after being built. The administration of the laws in Dublin was not as effective as it might be.

Dr. Howard Sinclair said sterilising milk made it very objectionable. As far as tuberculosis was concerned, the proper testing of cattle was very much preferable. In a town not far from Belfast a veterinary surgeon told him he had frequently seen meat with masses of tubercle in it exposed for sale in the shops.

Dr. O'Neill, in replying, said to boil milk badly did not sterilise it. If it were sterilised in the proper way its taste would not be destroyed. He agreed that the inspection of meat should be done by veterinary surgeons.

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THE MORTALITY OF INFANTS UNDER ONE YEAR FROM IMPROPER OR IMPERFECT FEEDING, WITH SUGGESTIONS FOR PUBLIC INSTRUCTION TO PARENTS AND NURSES ON THE SUBJECT.

By GEORGE P. COPE, L.R.C.S., L.R.C.P.I.;

Medical Officer and Medical Officer of Health, South City Dispensary;
Late Senior Assistant Resident Medical Superintendent, Richmond Asylum.

[Read in the Section of State Medicine, April 26, 1901.]

I VENTURE to bring under your notice this evening an important subject which deals with the mortality of infants (under one year), due very largely to the effects of improper or imperfect feeding, and to suggest certain steps to be taken that will aid very largely in reducing the high death-rate from this cause. I think it proper to submit this paper to the Section of State Medicine of the Royal Academy, in order that the subject may be discussed by the members, and, if approved of by them, that the College of Physicians may be requested to recommend the adoption of my scheme to the Registrar-General and to the Local Government Board in Ireland.

Before stating my suggestions, I wish to enumerate a list of diseases, together with the number of deaths caused by the same, which can be considered directly or indirectly as due in a large proportion to improper or imperfect feeding. The table is made out from the Registrar-General's Returns of Registered Deaths in Ireland of all

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children under one year from January 1st, 1890, to December 31st, 1899, kindly supplied to me by Dr. Ninian Falkiner, and is divided into two periods of five years.

You will perceive by the totals, comparing the second period of five years with the first period of five years, that the deaths increased by 2,188; and for the last year of Dr. Falkiner's return (1899) there was an increase of 206 compared with the average deaths for the second period of five years.

Let us take the disease with the highest mortality on the list, viz.—debility, atrophy, and inanition. In ten years there were 29,523 deaths, and for one year 2,932 deaths. Truly this classification is not satisfactory, it does not prove what was the direct cause of the death of these infants. When one finds that during the past five years over 3,000 deaths are classified under the heading of syphilis, premature births, and tuberculosis, these diseases are therefore clearly not included in the terms—debility, atrophy, and inanition. Improper feeding, then, remains nearly the sole cause of these deaths.

The next largest item on the list is convulsions. In ten years 19,185 deaths and in one year 1,740. Like the above heading it is unsatisfactory. Convulsions is not a disease; it is only a symptom which may arise from numerous causes. Meningitis, diseases of the brain, &c., being classed under their own headings (although producing convulsions) cannot be taken into account as a cause for this high death-rate. A large percentage is undoubtedly caused by improper feeding.

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Directly or Indirectly Caused by Improper or Imperfect Feeding.

Diseases	Five years, 1890-1894	Five years, 1895-1899	Total for ten years	One year, 1899
Debility, atrophy or inanition -	14,597	14,296	29,523	2,932
Cholera, simple - - -	212	547	759	156
Convulsions - - -	9,957	9,228	19,185	1,740
Diarrhœa - - - -	2,812	4,521	7,333	1,190
Dentition - - - -	582	494	1,076	84
Diseases of stomach - -	554	794	1,348	149
Dyspepsia - - - -	62	65	127	6
Enteric - - - -	31	28	59	3
Enteritis - - - -	358	496	854	105
Intussusception - - -	39	46	85	9
Liver disease - - -	171	166	337	42
Obstruction - - - -	176	183	359	42
Rickets - - - -	29	31	60	3
Tabes mesenterica - - -	1,781	2,021	3,802	448
Stomatitis - - - -	61	72	133	17
Thrush - - - -	88	81	169	19
Ulceration—intestine - -	3	2	5	1
	31,513	33,701	65,214	6,946

Before leaving these two headings I may add that a great number of these cases are registered as uncertified, and I think it is open to registrars of deaths, who are medical men, to diminish these classifications by ascertaining from a proper informer what led up to these symptoms and by registering the deaths accordingly. The same observation may apply to the term dentition. The

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mortality of infants from diarrhœa, tabes mesenterica, diseases of stomach, and enteritis, are very high; improper feeding may be taken as the chief cause. Under the other headings included in my table imperfect feeding, directly or indirectly, is accountable for the death-rate.

When we compare the number of deaths for the two periods of five years and one year, and find that these diseases are increasing our death-rate, steps should be taken immediately to assist in reducing this rate. Dr. Langford Symes, in his paper on the mortality of children in Ireland, very wisely remarked, "That the subject of infantile mortality seems to lie at the door of us physicians, and not the surgeons; with the high death-rate of children the surgeons appear to have little or nothing to do."

The mortality of infants from imperfect feeding may be considered as occupying a high place in our list. Mothers have daily brought their infants to my dispensary suffering from the effects of imperfect or improper feeding, and on questioning them they informed me that they were in the habit of giving their infants, aged three weeks old and upwards, all kinds of starchy food, such as potatoes, bread, cornflour, &c., and, in some cases, meat and oranges. They have fed their infants on these things from pure ignorance, not knowing they were doing harm. The rich as well as the poor labour under the same error. When such a state of affairs exists is it not our duty by some means or other to try and prevent a further continuance of this mistake?

The suggestion I now bring before you, if approved of and acted upon, will, in a very short period, reach every parent in Ireland, and must tend to lessen the mortality that has existed so long. The duty of every registrar of births at the time of registration is to issue to the infor-

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mant a vaccination paper; which contains instructions as to when the child must be vaccinated. I suggest that at the time of registration registrars be instructed to give to every informant a paper containing rules in relation to the proper feeding and general management of infants; also instructions in the elementary rules of hygiene. The documents should be provided at the expense of Government, and issued to the registrars at the time they receive their supply of vaccination papers from the Registrar-General. In an interview which I have had with Dr. Stafford, of the Local Government Board, and with the Registrar-General, they stated that they entirely approved of the scheme, but would wish the College of Physicians to recommend its adoption.

At some of our hospitals and dispensaries, especially the lying-in hospitals, they issue to mothers, when they are leaving, a pamphlet with full instructions how to manage their infants. Medical men attached to these institutions are well aware of the necessity for such advice. But in dealing with the large percentage of children born outside these hospitals, the only course open to us to educate the parents is by the means before suggested.

The report of the Committee appointed last year to consider the high death-rate in Dublin, stated that "the infantile death-rate in Dublin, while somewhat higher than that of London, is but little in excess of the average rate, in the thirty-three large towns of England and Wales, and is indeed considerably less than the infantile death-rate of some of these towns." This is attributed to climatic conditions being less favourable to summer diarrhœa in Dublin than in other places, and also to the practice among the Dublin mothers of the poorer class of suckling their children throughout the early months of infancy, instead of having recourse to the feeding bottle.

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Mothers who cannot suckle their infants ought to be encouraged to use sterilised milk, especially during the summer months: accordingly it would be advisable to embody in the instructions certain directions as to how to sterilise milk.

One of the recommendations in the Report of the Committee appointed to inquire into the health of the city was "that instructions should be given in day schools on the elementary uses of hygiene." I consider that more benefit would result if such rules were included in the instructions which I suggest should be given at the time of registration of a birth. Parents could thus be educated to ventilate and keep their homes free from dirt and contagion.

In conclusion, I would ask the Section of State Medicine to recommend the adoption of my suggestions to the Council of the Academy, with a view to a Committee being appointed to draw up rules on the feeding of infants, sterilisation of milk, and instructions in hygiene, &c.

Dr. Langford Symes said that the scientific regulation of artificial feeding on the lines suggested by Dr. Cope would certainly diminish, if not abolish, this mortality. Atrophy or marasmus was practically starvation, and a child might get a large amount of food but no nourishment, and a child might be starving when being fed on the richest kind of food, which it was perfectly unable to digest. Several people had examined the intestines of children who had died from this cause, and, in the later stages, they had found the beautiful structures for digestion and absorption completely abolished, and the intestines rendered like a hose or Indiarubber tube, the food going in at one end and rushing out at the other. The figures of mortality for the last ten years were appalling, and they might add to them a large proportion of other diseases, which might have had their origin in bad feeding. Convulsions were not always due to bad feeding; they might occur in the initial stages of fevers; but improper feeding was, undoubtedly, a

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frequent cause. Diarrhœa held a high place in the list, and that was entirely due to improper feeding. As to this diarrhœa it has been found that 97 per cent. of the deaths have been fed by hand, 3 per cent. being breast-fed. In times of great distress, during the siege of Paris and in the Lancashire famine, infant mortality was diminished, probably on account of breast-feeding being entirely adopted. Hyper-lactation was a bad thing, but it was better than poisonous food. He considered rickets to be the most serious of all causes, though the figures had not shown a great mortality from this cause. Rickets made diseases such as whooping-cough, pneumonia, bronchitis, &c., more dangerous, and the certified cause of death was often one of these diseases, when the real cause was rickets. He, therefore, believed rickets to be a greater cause of infantile mortality even than bad feeding; but it was due to bad feeding. With regard to the remedy, he did not know anything better than Dr. Cope's suggestions. Nothing could be done without the co-operation of the Registrar-General and the Local Government Board. All they could do was to represent the state of the case to the proper authorities. The Royal College of Physicians was the proper body to frame these rules, and the Registrar-General was the authority to circulate them, with the sanction of the Local Government Board.

Professor McWeeney said it seemed to him that, because they were a prolific race, they rather neglected their infants. In France, where the race was less prolific, more care was taken, and in the regulations drawn up at the Assistance Publique for the Care of Children, especially foundlings, there were many points which they might adopt. Speaking from the pathological point of view, he was in great ignorance as to the exact causation of death in many cases certified as marasmus, tabes mesenterica, and the like. At his own hospital it was the rarest possible thing to get a *post mortem* on a child under five—not one such autopsy in the year. He considered that, to make themselves absolutely certain as to the true cause of death, an attempt should be made by the profession to obtain autopsies on young children by an expert in as many cases as possible. It occurred to him that perhaps a representation might be made to the medical officers of the workhouses that some arrangement could be made whereby autopsies by an expert might be arranged. If they could have 100 consecutive autopsies on cases of infantile marasmus, diarrhœa, and tabes mesenterica, done by an expert, and helped by bacteriological

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examination, they would be better able to draw up rules to prevent the mortality. He passed over such well-known causes of danger as the tubercle bacillus in milk. There was one point to which insufficient attention had been paid, and that was the danger of giving children what he might call pseudo-sterilised milk—milk Pasteurised, raised to a point below boiling point, in which lactic fermentation had been checked, but spore-forming organisms were still present. The lactic organisms being done away with, the milk did not turn sour in the ordinary way, but the sporing forms, as Flügge has shown, produced toxic peptones or albumoses, which, when given to animals, produced diarrhœa, convulsions, and death. He, therefore, suggested that, when referring to the scalding of milk, an urgent recommendation should be made that, after Pasteurisation or sterilisation, it should be given to the child at once, or kept at such a low temperature, by being placed in cold water, as to prevent growth. A certain amount of the mortality in the upper and middle class infants might be due to this pseudo-sterilised milk. Leaflets on the subject should be attached to matter which had to be read, namely, the vaccination certificate, for both tuberculosis leaflets and infantile leaflets were often mistaken for tracts and thrown into the fire. He suggested that these leaflets be printed on paper of a different colour, and in a different type to the vaccination certificate, but attached thereto, so that they could not be separated.

The Registrar-General said that every effort in the direction indicated in Dr. Cope's valuable paper would have his most hearty co-operation. As had been pointed out, any action must originate with the Royal College of Physicians, and the approval of the Local Government Board should be obtained. His Department appeared to afford the best machinery for disseminating the information amongst the classes who were most concerned in the infantile feeding question.

Dr. Edgar Flinn said that this paper was especially interesting to him from the fact that he had occasion recently to hold an investigation into the causes of infantile mortality in one of the Unions in the city, and at which the feeding of infants was largely touched upon. The Registrar-General had kindly furnished him with statistics in regard to the deaths of infants in both the Dublin Unions, as well as for the Dublin Registration Area. These statistics were instructive reading. Dr. Cope had suggested an admirable and practical idea with regard to the proper instruction

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of mothers in the feeding of their young, and it was one that should commend itself—and he felt assured that the suggestions made by Dr. Cope would receive due and careful consideration from his Department.

Dr. Denham pointed out that a good deal had been already done on the same lines that Dr. Cope had proposed to the Royal College of Physicians. He himself, as a dispensary doctor, had issued to every patient since 1890 a printed form on the subject, and that pamphlet had been adopted by Dr. Kidd and issued to all the patients in the Coombe Hospital. His experience was that the infantile mortality was caused by the inanition of the mothers, to a large extent, and not by improper feeding. The women in this district all breast-fed their children. With regard to the registration question, every death in Ireland should be certified by a medical man.

Dr. Herbert Byrne remarked that up to May or June there was no diarrhœa. The poor people cannot get good milk. They are told to sterilise it, but they cannot do it. They may boil it, but it does not nourish the child then. He thought the cemetery authorities should not, on any account, inter a child registered by a foster-mother. An inquest should be held on such a death.

Dr. Martley said he had heard a good deal about the word sterilisation, and, as far as he could make out, it meant boiling. He wanted to protest against the idea of sterilisation being the ultimate goal. It was a splendid thing in its way, like the surgical treatment with antisepsis in place of asepsis. What they really wanted to do was to get the milk pure if they could, but he did not see how they were going to do it yet. If the race was brought up on sterilised milk for a few generations the ordinary germs found in pure milk would kill the infant of two or three hundred years hence. He thought the piece of Indiarubber piping frequently put on the end of feeding bottles had as much to do with killing the children as all the rest put together.

Dr. Horne said that, of all places, in Dublin the women took most care of their children. From his experience he believed that at least 90 per cent. were willing to nurse their children, so that the want of nursing could not be put forward as explaining the infantile mortality. Marasmus and inanition were terms used for want of better words, and meant simply nothing. He was of opinion that deaths should not be received unless properly certified, and if a medical officer had not been in attendance an autopsy should be held, whether supplied by Government or Municipal authority. He

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attributed the mortality—first, to the poverty of the people; secondly, to the state of the houses; and, thirdly, to drink. He looked upon rickets as extremely uncommon in Dublin, compared with Continental and other cities. From the economic point of view they found that the poor mother with a large family was obliged to have recourse to farinaceous foods, and if they got rid of the poverty they would remedy the mortality. Some of the lying-in hospitals had issued printed rules to parents, but they either threw them into the fire, or if they read them they thought they knew better. He thought it would be useless to attach rules to the vaccination paper, considering that in the Sackville-street Vaccine Institute, where there was a better class than in the dispensaries, the people got their papers folded and never read them.

Dr. Ninian Falkiner presented the statistics for the total births and deaths of children under one year, with the rate of deaths to 1,000 births, for 1899 and 1900, and average rates for two periods of ten years, the figures for the year 1899 being taken respectively from the Annual Reports of the Registrars-General for Ireland and England. The figures for 1900, being abstracted from the Quarterly Reports, are subject to revision.

INFANTILE MORTALITY.

Deaths of Children under One Year per 1,000 *Births.*

Year 1899.

	Total Births	Deaths of Children under One Year	Death Rate per 1,000 Births	Average Death Rate per 1,000 Births 1889-98
Ireland -	103,900	11,200	108	101
England -	928,646	150,975	163	151

Year 1900.

	Total Births	Deaths of Children under One Year	Death Rate per 1,000 Births	Average Death Rate per 1,000 Births 1890-99
Ireland -	101,262	11,014	108	102
England -	926,304	142,943	154	153

Dr. Thompson said that from the cases in his hospital he was led to believe that the mortality was in the hand-fed, and not the breast-fed infants. He found out that the printed instructions distributed by the lying-in hospitals were never read, except,

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perhaps, when the baby was really sick. He had had short instructions typed telling how to feed the baby at different periods, and in some cases with good effect. The difficulty was really the poverty of the patients. He had read, some time ago, of an institution that was started partly by the municipal authorities and partly by philanthropy, whereby sterilised milk was brought in from the country and distributed to the deserving poor. In some parts of the city here, where the people were really very poor, an institution of that sort might really help to decrease mortality.

Sir Charles Cameron observed that if they took the death-rate of the Dublin Registration Area it was considerably below that of the 33 large towns of England, whereas if they took that of Dublin city alone it was but slightly lower. It must be remembered that in this country only about one-fifth of the population resides in towns, whereas more than two-thirds reside in towns in England. A good deal of the unhealthiness arose from general insanitary conditions, more especially exposure to cold, and he ventured to say that there was not a more under-dressed juvenile population in any equally cold country. It was similarly with infants; they were not kept sufficiently warm in the winter, and many of them died from respiratory diseases. Drunkenness was increasing in women, and how could the milk of women—underfed and drunken—be wholesome for children? He had seen the milk in poor homes kept under circumstances where it was impossible to preserve it. It was purchased only once a day, and the milk given to infants was often that of the previous night.

Dr. Cope, replying, referred to Dr. McWeeney's plea for autopsies. One pathologist found that catarrhal conditions of the intestine, with enlargement of the glands without tubercular deposits, often caused considerable wasting. It would be open to registrars, when giving the vaccination paper, to tell the people that these instructions were on the paper. With regard to the statement that only ten per cent. were hand-fed, if they saved that ten per cent. it would be doing a good deal. As he had mentioned in his paper, dispensaries and lying-in hospitals had already issued pamphlets on the subject.

The following resolution on the subject was proposed by Dr. Cope, and seconded by Dr. Craig, and adopted and forwarded to the Council of the Royal Academy of Medicine:—

"That the Section of State Medicine of the Royal Academy of Medicine, Ireland, believing that a large number of infant children

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are dying in Ireland, as elsewhere, annually, from improper or imperfect feeding, are of opinion that instructions as to the proper feeding and hygiene of infants should be issued to the people, and that the Section, having considered by what possible means this undertaking should be carried out, consider that the assistance of the Registrar-General for Ireland and the Local Government Board is indispensable, and that the Council of the Royal Academy of Medicine be asked to appoint a sub-committee to confer with the Royal College of Physicians, the Registrar-General, and the Local Government Board, as to the best means of preparing the proposed regulations and distributing them to the public."

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ON THE PREVALENCE AND CHARACTER OF TUBERCULAR LESIONS AMONGST IRISH DAIRY CATTLE.

By E. J. McWEENEY, M.A., M.D., D.P.H.

[Read in the Section of State Medicine, April 27, 1901.]

OWING to the action of the Board of National Education, and of the Department of Agriculture and Technical Instruction, I have been placed in a position to form a well-grounded opinion as to the prevalence of tuberculosis amongst dairy cattle in Ireland. The stock of milch cows—the examination of which I have been enabled to carry out—comprises only animals of the highest class, and apparently in the best of health, with a normal yield of milk. They are kept in a well-ventilated byre, under good hygienic conditions. Their sojourn in the byre lasts from October to May. During the warmer part of the year they are out on grass, coming in twice daily to be milked. As each animal runs dry it is fattened for the butcher, but before being sold each is inoculated with tuberculin, the temperature being taken three times a day before and after the injection. Of late the tuberculin used has been exclusively that manufactured by the Hœchst Chemical Company, and sold in London by Meister, Lucius & Bruning. A double dose is generally given, and the results have proved so reliable that when a beast reacts, and I can find no tubercle at the *post-mortem*, I now ascribe the fact not to absence of tubercle, but to the unavoidable incompleteness of my examination of the carcase. I may add that subsequent to an early stage in the investigation I have not met with cases of tuberculosis which had failed to react.

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About a fortnight after the application of the tuberculin test, the animal is slaughtered in my presence, and I inspect the carcase, so far as it is possible to do so, without interfering with its selling value. The following is a tabulated statement of the results:—

Number of cows examined, 88.

Found tuberculous, 47 (53·4 per cent.).

Free from tubercle, 40 (46·5 per cent.).

Doubtful, 1.

Out of the 47 tubercular cows—

The bronchial and pr. mediastinal glands were affected in 42 (89·3 per cent.).

The lungs were affected in 29 (61·7 per cent.).

The pleura was affected in 7 (14·9 per cent.).

(In all of these cases of pleural tubercle the lung was affected, and in two the peritoneum as well. These two latter are noted as "Grapes.")

The liver was affected in 7 (14·9 per cent.).

The portal lymph glands were affected in 6 (12·87 per cent.).

(In not one of these was the liver itself affected.)

The peritoneum was affected in 3 (6·4 per cent.).

The mesenteric glands were affected in 1 (2·1 per cent.).

The submaxillary lymph-glands were affected in 2 (4·2 per cent.).

The udder was affected in 0 (0 per cent.).

The udder was never found affected, though on two occasions it presented, on palpation, a diffuse feeling of induration. The microscope, however, failed to detect anything more than an increase in the interacinous connective tissue, with some small-cell infiltration. The mesenteric glands were only once found affected, and another case where they were enlarged is marked "doubt-

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fully tubercular." The intestinal mucous membrane was never found in a state of tubercular ulceration. I did not have the bowel opened, as a rule, but relied on implication of the mesenteric glands as indicating the necessity of searching for tubercular ulcers in the bowel. The spleen was never found affected with tubercle.

Referring now to the character and diffusion of the lesions, I may say that they were, with very few exceptions, chronic in type and limited in their distribution. Amongst the 47 cows in which the disease was found, I did not come across a single case of universally disseminated miliary tubercle. Localised miliary tubercle surrounding older foci in lungs and glands was noted twice. In both of these there was pronounced hyperæmia, and the young grey tubercles were imbedded in a soft, intensely hyperæmic zone that surrounded the old fibro-caseous nodules. I think it not unlikely that the fresh outbreak may have been the result of the tuberculin injection. On several other occasions I was struck by the congested appearance of the vessels in the zone of tissue immediately surrounding the older foci.

One of the leading microscopic features of the tubercular lesions was the extreme fewness of bacilli. Numerous cover-slip films were made from each of the 47 positive results, broken-down cheesy matter from so-called tubercular abscesses in the lung or from the fibro-caseous lesions of the affected lymphatics being repeatedly examined without success. The tubercle bacillus was microscopically demonstrated in about 10 per cent. of the cases, and when found was present in very small numbers only. Even in fresh grey tubercles recently developed round an older focus, it was in most cases found impossible to demonstrate a single bacillus in carefully-prepared serial sections. The inoculation test was

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performed on guinea-pigs in four of the cases, where, despite prolonged search, the bacillus had escaped detection. Fragments of the same material that had baffled the microscope were pounded up in sterile broth and the broth injected into the subcutaneous tissue of the thigh. All four animals developed a caseous abscess at the seat of inoculation, followed by enlargement of the corresponding inguinal glands, and subsequently of the sub-lumbar glands and engagement of the abdominal viscera. The more I study this part of the subject the more difficult do I find it to understand how it is that such exceedingly small numbers of bacilli can produce such extensive and progressive lesions. The experimental tuberculosis of the guinea-pig produced by the introduction of such material is rich in bacilli. The suspicion now and then forces itself on my mind that perhaps the bacillus may undergo some change or pass into some stage of development wherein it becomes inaccessible to our present methods of microscopic study. I am quite aware of the improbabilities inherent in such a view, which is not, so far as I am aware, borne out by any observation made on other bacterial species. Yet, after a prolonged and vain search in what I cannot but regard as tubercular matter of recent origin and rapidly progressive character, and when I reflect that the same matter introduced into a susceptible animal (guinea-pig) will, in a few weeks, engender vast numbers of bacilli, I cannot refrain from at any rate harbouring the suspicion.

The large and striking masses of newly-formed connective, often caseous or calcified in the centre, and called "grapes" by the trade—*Perlsucht* of the Germans—are particularly unfavourable material in which to seek for tubercle bacilli. Yet it is impossible to imagine that they can be formed save as the result of a powerful stimulus,

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such as can hardly be furnished by the vanishingly small number of bacilli discoverable by the microscope.

I do not think that the flesh of any of these 47 tuberculous cows could be regarded as prejudicial to health, at any rate on the score of the tuberculosis.

In conclusion, I may mention that the results which I have obtained from the *post-mortem* examination of a herd of cattle from the extreme South of Ireland have been practically identical with those above detailed, and I, therefore, feel justified in supposing that the figures I have obtained fairly represent the condition as regards tuberculosis of the dairy-cows throughout Ireland, or at any rate do not overstate it.

I am at present engaged in arranging a consecutive series of experimental inoculations with the milk of such cows as are but slightly affected with tubercle, the object being to ascertain whether—apart from tuberculous disease of the udder—they ever yield infective milk. I hope to have the results ready for the forthcoming Congress in London, and to subsequently communicate them to this Section of the Academy.

Sir Charles Cameron said the subject was of great importance in public health, as a great number of animals were destroyed, which, if unnecessarily, would be a great waste. He had never taken an extreme view on the subject of tuberculous animals, and unless he saw the disease in a very advanced stage, the lungs infected, and the animal wasted, he did not condemn the animals. Many Medical Officers of Health condemned an animal if there was tuberculosis in any of the organs.

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THE PERITONEUM OF THE PELVIC CAVITY.

By A. FRANCIS DIXON, M.B., Sc.D.,
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AND

A. BIRMINGHAM, M.D., F.R.C.S.I.,
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[Read in the Section of Anatomy and Physiology, May 31, 1901.]

SUMMARY.

THE following brief summary gives our chief conclusions which are set out in detail below. As will be seen, many of them are in close agreement with Waldeyer's results.

(1) In the *hardened body, with empty bladder and rectum*, the peritoneum of the pelvis forms one general cavity practically co-extensive with the pelvic cavity itself. This is subdivided by more or less distinct ridges of peritoneum—caused by the projection of underlying structures—into *three primary districts or fossæ*, which are morphologically equivalent in the two sexes—namely, an anterior or vesical, a middle or genital, and a posterior or rectal.

(2.) *The anterior primary fossa* is separated from the middle at each side by a slight peritoneal ridge, corresponding in position to the ureter (as it courses downwards and inwards to the lateral angle of the bladder) and between these by the posterior border of the bladder. It presents in its middle region a convex triangular area, corresponding to the upper surface of the bladder. On each side of this is an elongated depression, extending from the lateral border of the bladder internally to the horizontal portion of the vas deferens laterally, and known as the

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paravesical fossa, which is invaded by the bladder on distension, and thus reduced to a mere slit or fissure. Still further out, on the side wall of the pelvis and above the vas deferens, is the *fossa obturatoria*, which is bounded above and in front by the external iliac vein, and behind by the ureter. In the posterior part of the obturator fossa is situated the *fossa ovarica* of the female.

(3.) *The posterior primary fossa* is separated from the middle by two well-marked peritoneal ridges—the *sacro-genital folds*, which are produced by the sacro-genital ligaments. These latter are two bands of mixed fibrous and muscular tissue which pass from the region of the genital ducts in the male (of the isthmus uteri in the female) outwards and backwards on each side to blend with the tissue on the front of the lower end of the sacrum and the back of the rectum. The sacro-genital folds become continuous with one another, about a half to one inch behind the empty bladder in the male; on the back of the isthmus uteri forming the torus uterinus in the female.

The posterior primary fossa presents a central area, corresponding to the rectum, at each side of which is an elongated depression, the *para-rectal fossa*. This latter is invaded by the rectum during distension. Inferiorly, as the rectum sinks down to pierce the pelvic floor, the two para-rectal fossæ become continuous in front, and this lower part of the posterior primary fossa is known in the female as Douglas's pouch; it may be called in both sexes the *recto-genital pouch* or fossa, for it lies between the rectum behind and the genital ducts—vasa deferentia and seminal vesicles, or cervix uteri, in front.

Laterally, above the level of the sacro-genital folds, the para-rectal fossæ pass without demarcation into the *hypogastric fossæ* on the side wall of the pelvis.

(4.) *The middle primary fossa*, which is related to the

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terminal portions of the genital ducts—the vasa deferentia and seminal vesicles in the male, and the uterus in the female—is separated, as already described, from the anterior fossa by the ureters at the sides, and by the posterior border of the bladder mesially. The sacro-genital folds separate it from the posterior fossa. In the male it is divided by the portion of the vas deferens which lies behind the plane of the ureter into a wider lateral part which passes into the hypogastric fossa on the side of the pelvis, and a narrower shelf-like mesial portion beneath which lie the seminal vesicles and the transverse portions of the vasa deferentia. The bladder during distension invades this mesial part, which may then be said to disappear. There is often present between the bladder in front and the terminal portions of the vasa deferentia behind a slight depression—well-marked in the embryo—which corresponds to the utero-vesical pouch in the female. The term *genito-vesical pouch* may be applied to these corresponding parts in the two sexes.

In the female the uterus projects upwards into the mesial portion of the middle fossa; at each side of it is a depression, the *fovea para-uterina*, which passes without demarcation into the lateral portion of the middle fossa.

(5.) The line of attachment of the broad ligament runs from the side of the uterus out over the terminal part of the ureter, then upwards across the extreme posterior portion of the paravesical fossa to enter the obturator fossa. As it traverses the latter it marks off a posterior part—the *fossa ovarica*—in which the ovary lies.

(6.) In the female the round ligament separates the paravesical from the obturator fossa.

(7.) On each side, behind the ureter, a ridge may be seen passing downwards and inwards. These have been described as the "ligaments utéro-lumbaires" (Vallin) or

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"plicæ utero-lumbales" (Waldeyer). They are really produced by nerve cords passing downwards from the hypogastric plexus, near the sacral promontory, to the pelvic plexus of each side, near the upper end of the seminal vesicle or cervix uteri.

(8.) Between the lower portion of the ileo-pectineal line internally and the external iliac vein externally, is a triangular area, bearing interesting relations to the vas deferens, the obliterated hypogastric artery and the crural ring; this we have described under the name of the *trigonum femorale*.

DETAILED ACCOUNT.

When bodies are hardened by the intravascular injection of strong solutions of formalin, the ureter, vas deferens, bladder, and other pelvic structures, muscular and fibrous, become firm, indeed almost rigid, and many of them are seen to give rise to projections, or ridges, of the peritoneum, which are not so easily made out in the ordinary unhardened condition. The peritoneum itself, too, becomes fixed, and the details of its arrangements, which are often obscure in soft bodies, become comparatively clear.

In such a body, with the bladder and rectum empty, the peritoneum lining the pelvic cavity is arranged in the form of three great primary fossæ—an anterior, related to the bladder; a posterior, related to the rectum; and a middle, related to the uterus in the female, to the vasa deferentia and the vesiculæ seminales in the male. The term "fossa" is suggested for these subdivisions of the pelvic cavity for want of a better name, and is not used in the strictest sense of the word. These three pelvic fossæ might be compared to the great fossæ of the base of the cranium, to which indeed in a general way they bear a slight superficial resemblance.

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The anterior primary fossa of the pelvic peritoneum corresponds to what may be called the vesical region of the pelvic cavity. The bladder when empty lies in its central portion; when distended it occupies almost the entire fossa.

It is separated from the middle primary fossa behind, by the line of the ureters, which latter, together with the surrounding tissue and vessels, except when a considerable amount of subserous fat is present, may be seen shining through the peritoneum, or may even produce two fairly distinct ridges running downwards and inwards to reach the lateral angles of the bladder. Between the terminations of the two ureters the fossa is limited by the posterior border of the bladder, the position of which is always easily identified in the empty condition.

In front and at the sides the fossa extends up to the pelvic brim, and, further back, just in front of the ureter, to the level of the external iliac vein. It is made up of two large lateral concave portions, triangular in shape, and separated from one another by the projection of the empty bladder, and of a mesial convex part corresponding to the upper surface of the bladder itself. This latter, the *middle subdivision* of the anterior primary fossa, requires no special description; it is triangular in outline, corresponds in extent to the upper surface of the bladder, and is sometimes crossed by the peritoneal fold or folds constituting the plica vesicalis transversa.

The lateral subdivisions of the anterior primary fossa, which lie at the sides of the bladder, approach each other in front of the bladder apex, where they are merely separated by the urachus. They are limited—*below* (or internally) by the lateral border of the bladder and proximal part of the urachus; *behind,* by the ureter, which pro-

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duces a distinct, though slight, ridge of the peritoneum when the bladder is firmly contracted; and *above and in front* (*i.e.* laterally) by the brim of the pelvis, and also in part by the external iliac vessels near their origin. The lower part of the peritoneal ridge or fold which indicates the course of the ureter, usually contains also the inferior vesical and middle hæmorrhoidal vessels: the fold is usually more distinct in its lower than in its upper part.

Beneath the peritoneum of this district of the pelvic wall are found the body and superior ramus of the pubes anteriorly, and the levator ani and obturator internus muscles more posteriorly.

Each lateral subdivision of the fossa is traversed from before backwards by the horizontal portion of the vas deferens, which can usually be seen shining through the peritoneum as it runs backwards in a somewhat wavy course on the pelvic wall. A triangle is thus marked off above the vas, which is approximately equilateral—the sides measuring about two inches (one and a half to two and a quarter). This practically corresponds to Waldeyer's *fossa obturatoria*, and is bounded by the ureter behind, by the vas deferens below, and by the external iliac vein and pelvic brim above and in front. Below the fossa obturatoria, and separated from it by the vas deferens, is the *paravesical fossa* of Waldeyer. This fossa is somewhat quadrilateral in outline, and is bounded in front by the pelvic brim, behind by the ureter, above by the vas, and below by the lateral border of the empty bladder and the proximal part of the urachus. The fossa obturatoria and the paravesical fossa, as here described, taken together constitute the lateral subdivision of the anterior fossa of the pelvis as defined above.

It must be noticed that the obturator and the para-

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vesical fossæ just described do not exactly correspond to the districts to which Waldeyer,[a] in his work upon the topographical anatomy of the pelvis, has given these names. Waldeyer's obturator fossa is limited above by the obliterated hypogastric artery (arteria umbilicalis), and therefore does not extend upwards to quite so high a level as the district to which we have ventured to apply the same name. In fact, the fossa as described by him does not quite reach the pelvic brim. In the case of the paravesical fossa, Waldeyer includes within it the deep epigastric artery (vasa episgastrica inferior), and thus this fossa, as described by him, lies partly above the pelvic brim. We believe that it will be found more convenient to restrict the term "paravesical fossa" to the district which lies below the brim of the true pelvis. The portion above is usually distinctly marked off, and belongs to the abdominal cavity proper. The description which we have given corresponds more accurately with that given by Waldeyer at a meeting of the Anatomical Society, held in Dublin in June, 1897.[b]

The obliterated hypogastric artery forms a slight (sometimes a prominent) ridge as it runs downwards and forwards on the pelvic wall, close to the brim of the pelvis, which it finally crosses obliquely in its course to reach the anterior abdominal wall. Having traversed the obturator fossa the hypogastric vessel almost always crosses the upper anterior angle of the paravesical fossa before it leaves the pelvis. When fat is absent the obturator vessels and nerve may be seen running forwards and downwards beneath the peritoneum of the obturator and upper part of the paravesical fossa, and lying at a lower

[a] "Das Becken," 1899, page 238.

[b] "Topographical sketch of the lateral wall of the pelvic cavity." Journal of Anatomy and Physiology, vol. xxxii., 1898, page 1.

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level than the hypogastric artery.[a] Under similar conditions the vesical vessels can be distinguished as they run inwards across the fossæ to reach the bladder.

The paravesical fossa is also crossed by the variably developed *plica vesicalis transversa* (Waldeyer), a small fold of peritoneum which runs outwards from the upper surface of the empty bladder across the pelvic floor to the side of the pelvis and generally pursues a course in the direction of the internal abdominal ring. In size the fold is very variable—sometimes extremely small, when it extends out but a short distance from the bladder; in other cases, and commonly in the fœtus, it can be traced across the pelvic brim as far as the internal abdominal ring. It may or may not join with its fellow on the upper surface of the bladder. Sometimes several folds are present, while occasionally no representation of the plica can be distinguished, or the fold may be present upon one side and absent on the other. On the whole, the plica transversa seems to be better developed and more constantly present in the male than in the female, a fact which is probably to be associated with the greater development of the processus vaginalis in the male fœtus.[b] The fold often corresponds in position on one or both sides to the course of the superior vesical artery. We have found the fold too variable both in occurrence and position to serve as a practical or useful line of subdivision of the paravesical fossa into anterior and posterior portions as described by Waldeyer.[c]

[a] The exact relationships of these structures has been described by Waldeyer, loc. cit.

[b] Compare A.F.D. "The form of the empty bladder and its connections with the peritoneum." Journal of Anatomy and Physiology, Jan., 1900, vol. xxxiv., page 193.

[c] "Das Becken." Page 238, and Journal of Anatomy and Physiology, vol. xxxii., p. 1.

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In front the peritoneum of the anterior pelvic fossa is continued upwards, across the pelvic brim, into that of the inner and middle inguinal pouches or fossæ (fovea supravesicalis and fovea inguinalis medialis). Near the middle line the transition of the pelvic peritoneum into that of the anterior abdominal wall is direct, at the pelvic brim; farther from the middle line, however, the peritoneum is at first continued across a triangular interval, and forms a little fossa before it reaches the abdominal wall from the pelvis. This little interval, or fossa, which we have called the *trigonum femorale*, may be considered to be formed in the following manner:—The external iliac vein pursuing a direct course forwards, downwards, and outwards to pass beneath Poupart's ligament, leaves the pelvic brim about one and a half to two inches in front of the point where the ureter enters the pelvis, whilst the ileo-pectinal line arches inwards and downwards, and thus an angular interval is left between these two structures. This interval, which is a portion of the abdominal and not of the pelvic cavity, is the trigonum femorale. It is bounded externally by the external iliac vein, internally and below by the lower part of the ilio-pectinal line, and anteriorly by the inner part of Poupart's ligament. Beneath the peritoneum lining the fossa is the origin of the pectineus muscle, and usually some lymphatic glands of the iliac group. At the lower and outer part of the triangle is the *fovea femoralis*, or depression corresponding to the position of the crural canal. The upper angle of the triangle which lies between the ileo-pectineal line and the iliac vein is very acute, and is crossed by the abdominal part of the vas deferens, here passing backwards from the internal abdominal ring to enter the pelvis. The inner and lower part is crossed by the fold of peritoneum (plica um-

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bilicus lateralis) which contains the obliterated hypogastric artery as it turns upwards from the pelvis to reach the anterior abdominal wall. This fold is very variable, not infrequently it is strongly marked and may project in its lower part from a half to one inch into the abdominal cavity, giving the fovea femoralis, which lies to its outer side, the appearance of a deep pyramidal fossa, opening upwards into the abdominal cavity. The lateral portion of the plica vesicalis transversa, in those cases in which the fold is strongly developed, is also found on the floor of this fossa as it is continued outwards towards the internal abdominal ring.

The term "excavatio-parietovesicalis" is used by Waldeyer to indicate the groove-like depression, at the bottom of which the peritoneum of the side wall of the pelvis and that covering the bladder become continuous. When traced backwards this peritoneal groove is described (by Waldeyer) as running into the recto-vesical pouch, the line of separation of the two depressions being, however, marked by the "rectovesical" fold. The outer wall of this groove, in as far as it lies in front of the plane determined by the ureter, is a portion of the paravesical fossa. We do not consider the term excavatio "parieto-vesicalis" applicable to any part of the peritoneum which lies behind the lower end of the ureter and posterior border of the bladder and we would suggest that the term—if it is to be used at all—be restricted to the part of the groove which lies in front of the plane determined by these structures. The district behind the ureter and in front of the "recto-vesical" fold is a portion of the middle primary fossa or genital subdivision of the pelvic cavity as described by us. In the female the central portion of this district is occupied by the uterus, and the more lateral part forms the fovea para-uterina (Waldeyer); in the male the

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terminal parts of the vasa deferentia and the seminal vesicles occupy a corresponding position.

The posterior primary fossa of the pelvic peritoneum forms what may be termed the rectal subdvision of the pelvic cavity, since the empty rectum occupies its central position—the distended organ the greater part of the fossa.

This large fossa is limited by the posterior wall of the pelvis behind, and is separated from the middle fossa in front when the bladder is empty by a prominent crescentic (sacro-genital) fold, which runs across transversely, about a half to one inch behind the posterior border of the bladder. Laterally this fold, curving backwards, fades away into the peritoneum on the side wall of the pelvic cavity, and beyond this the middle and posterior primary fossæ are confluent in the hypogastric fossa (of Waldeyer). In front of the free projecting edge of the fold just mentioned the vas deferens turns inwards towards the base of the bladder.

The anterior wall of the posterior fossa, which is overhung by the crescentic fold, is nearly vertical, and corresponds chiefly to the posterior aspects of the ampullary portions of the vasa deferentia near the middle line, and to the seminal vesicles laterally. In the female it is formed by the cervix uteri and upper part of the vagina. The height of this wall varies according to the conditions of the bladder and rectum, from one-eighth to three-quarters of an inch in the male, but it is usually greater—and may exceed an inch—in the female. It is also nearly always greater laterally than in the middle line of the pelvis, corresponding to the greater depth of the posterior fossa in this position.

The projection forwards of the empty rectum divides the posterior primary fossa into two lateral concave portions,

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already described by one of us [a] as the "para-rectal fossæ." These correspond in their nature to the paravesical fossæ described above, and their relationship to the rectum is comparable to that of the latter fossæ to the bladder. When the two organs are empty and contracted, the fossæ are large and distinct, but as the bladder and rectum become distended the fossæ are reduced in size, or almost obliterated, owing to the enlarged organs invading them and stripping the peritoneum off the adjacent portion of the pelvic wall. The reduction of the fossæ is, however, much more complete in the case of the para-vesical than in the case of the para-rectal fossa.

When the rectum turns down to pierce the pelvic floor the para-rectal fossæ of opposite sides may be said to meet in the middle line interiorly. This meeting takes place at the bottom of the peritoneal depression which lies below the level of the crescentic fold, and between the rectum behind and the vasa deferentia (or upper part of the vagina in the female) in front. This depression, as seen in mesial section, is known as the recto-vesical pouch, or pouch of Douglas. The term *recto-genital* has been suggested by one of us as being more accurate than recto-vesical in the case of the male, and as being appropriate also to the corresponding depression in the female.[b] When traced upwards from this point, where they are confluent, the para-rectal fossæ are at first separated from one another by the width of the rectum. Higher up, however, above the third sacral

[a] A.B. "Some points in the anatomy of the digestive system." Journal of Anatomy and Physiology, vol. xxxv., Oct., 1900, page 65.

[b] A.F.D. Loc. cit., page 192. B. Cuneo and V. Veau, "Signification morphologique des aponévroses périvésicales," Journal de l'Anatomie, 1899, page 244, use the term "sémino-rectal"; Fredet, "Traité d'Anatomie humaine" (Poirier), Tome iv., 1900, page 1042, describes the pouch as "recto-séminal" in the male, and also emphasises the fact that the pouch is "vésiculo-rectal" rather than "recto-vésical." He uses the term "cu de-sac génito-rectal" for both sexes.

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vertebra, the pelvic mesocolon alone intervenes between the fossæ of opposite sides. On the left side the upper limit of the para-rectal fossa lies at the point where the pelvic mesocolon crosses the iliac vessels; on the right the fossa ends superiorly at a line drawn outwards from the sacral promontory to meet the iliac vessels. It is the lower portions of the fossæ which become taken up and obliterated during distension of the rectum. The peritoneum forming the para-rectal fossa lies in front of the lateral part of the sacrum and the pyriformis muscle. Beneath it are also to be found the anterior divisions of the sacral nerves with some of their branches and connections, the pelvic portion of the sympathetic cord, the lateral sacral vessels, and on the right side a portion of the middle sacral artery. On the left side some branches of the superior hæmorrhoidal vessels are also present. Beyond the lateral margin of the sacrum the peritoneum of the side wall of the pelvis sweeps forwards, covering the large branches of the internal iliac artery, and the para-rectal becomes continuous with the hypogastric fossa. In the undissected part no ridge or mark can be made out which will give a suitable boundary between these two peritoneal-covered districts of the pelvic wall. Waldeyer[a] describes the lateral border of the sacrum as forming the limit of the hypogastric fossa, yet he notices that the "recessus para-rectalis"—a chink which intervenes between the rectum and side wall of the pelvis—may have branches of the iliac artery or even the ureter in its outer wall when the rectum is distended. Thus the outer wall of Waldeyer's para-rectal recess, which corresponds in part to the para-rectal fossa described in this paper, may, in the distended condition of the rectum, include the hypogastric fossa. The same recess has been described by Jonnesco[b] under the name "fosse recto-pelvienne."

[a] Loc. cit. Page 240 and page 271.

[b] "Traité d'Anatom humaine" (Poirier). Tome iv., 1895, page 358.

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The middle primary fossa of the pelvic peritoneum.—As the anterior fossa is related to the bladder, and the posterior fossa to the rectum, similarly the middle fossa is related to the terminal portions of the genital ducts of the embryo—namely, to the vasa deferentia and vesiculæ seminales in the male, and the uterus in the female adult.

This middle fossa, which is narrow mesially, but wider laterally, is separated from the anterior fossa by the ureter and the posterior border of the empty bladder. Posteriorly it is limited in the male by the crescentic (sacro-genital) fold which runs transversely one half to one inch behind the posterior border of the empty bladder in the male. In the female the separation of the middle from the posterior primary fossa is effected by a similar crescentic fold, the lateral parts of which are the folds of Douglas (plicæ recto-uterinæ). These latter are continuous across the middle line at the back of the uterus, in the vicinity of the isthmus, and constitute there a slight ridge, known as the torus uterinus.

Above (*i.e.*, laterally) the fossa broadens out and passes without demarcation into the side-wall of the posterior part of the pelvis. The portion of the vas deferens which passes backwards beyond the ureter, marks off in the male an upper lateral from a lower mesial subdivision of the middle primary fossa—the former appearing on the side-wall, the latter on the floor, of the pelvic cavity. The lateral subdivision is the more extensive, and corresponds in part to the fossa hypogastrica of Waldeyer. It is not marked off posteriorly from the upper lateral part of the para-rectal fossa. Beneath the peritoneum of this part of the side-wall of the pelvis lie several of the branches of distribution of the internal iliac (German, hypogastric) vessels.

The mesial subdivision is narrow, and is continuous with the corresponding district across the middle line

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forming a horizontal shelf, which runs transversely behind the (empty) bladder. Immediately beneath the peritoneum of this shelf lie the upper ends of the seminal vesicles and the transverse portion of the vasa deferentia. The bladder during distension invades this part of the pelvis, and the peritoneum is then taken up in such a manner that the mesial subdivision of the middle fossa practically disappears.

Near the middle line, just behind the empty bladder, and between it and the vasa deferentia, here approaching one another, is often found a slight depression, which, we believe, corresponds to the utero-vesical pouch of the female. The term "genito-vesical pouch," or depression, seems applicable to this recess in both sexes.[a]

In the female the peritoneum of the central part of the middle primary fossa is raised up to cover the body of the uterus as low down as its isthmus. Below the level of the torus uterinus the peritoneal covering of the uterus is derived from the recto-genital pouch—a portion of the posterior primary subdivision of the pelvic peritoneum. At each side of the uterus, between the crescentic (sacro-genital) fold of Douglas behind, and the ridge produced by the ureter and accompanying vessels in front, there is a distinct fossa or depression named by Waldeyer the fovea para-uterina. The outer wall of this depression is formed by the side-wall of the pelvis, and becomes continuous with the hypogastric fossa.

[a] The presence of this depression and its significance have already been noted by one of us (A.D.F. loc. cit., p. 190). The interesting observations of Cunéo and Veau (loc. cit., p. 242) have demonstrated that the fossa in question is strongly marked in the embryo, and that during the course of development there is a complete correspondence in the arrangement of the peritoneum of the region in the two sexes. They apply the term "cul-de-sac vésico-séminal" to this fossa in the male embryo and to the corresponding fossa when it persists in the adult. See also Fredet (loc. cit., p. 1042), who uses the terms "cul-de-sac vésico-séminal" and "cul-de-sac génito-vésical" for this depression in the embryo and child.

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Behind the plane determined by the ureter a variably developed, but often strongly-marked, ridge may be seen, in both sexes, passing nearly vertically downwards on the side-wall of the pelvis. This ridge, somewhat variable in position, often meets the line indicating the course of the ureter near the point where the latter is crossed by the vas deferens in the male. When traced upwards it passes in the direction of the sacral promontory. Beneath the peritoneum of the ridge is to be found the nerve cord which connects the upper part of the hypogastric plexus (inter-iliac plexus) with the pelvic plexus. In some cases the ridge is double on one or both sides. We are inclined to believe that these peritoneal ridges or folds are the "ligaments utéro lombaires" described by Vallin,[a] or "plicæ utero lumbales" of Waldeyer.[b] Each nerve cord, with its surrounding connective tissue, is closely adherent to the bodies of the last lumbar and first sacral vertebræ superiorly, and below joins the great ganglionic mass situated near the outer end of the seminal vesicles or at the side of the cervix uteri. They might easily be mistaken for tissue similar to that enclosed within the folds of Douglas in the female.

Although we are not in a position to state that in every case these ridges or folds are produced by nerve cords, still we believe that in a majority of instances they will be found to be so produced. The ridges which we have found to be produced in the manner mentioned agree exactly in position with the "ligaments utero-lombaires" as described by Vallin.

The crescentic fold which separates, in the manner described above, the middle from the posterior primary

[a] "Situation et Prolapsus des Ovaires," Paris, 1887, pages 14–17 and plates i. and ii.

[b] Waldeyer, loc. cit., pages 495, 531, 533, also figures 81a and 85, pages 439 and 462.

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fossæ of the pelvic peritoneum requires further notice. In the female it is composed of two lateral portions—the folds of Douglas or plicæ recto-uterinæ—and of a mesially placed connecting portion—the torus uterinus. In the male the fold is always distinct when the bladder is empty and contracted. Its free edge—especially well-marked near the mesial plane—projects horizontally backwards, and overhangs the recto-genital pouch. This edge lies some distance—one-eighth to half an inch—behind the plane of the vasa deferentia as they turn inwards. When the bladder becomes distended the mesial portion of the fold becomes taken up, but we have found the lateral portions well-marked in a male subject, in which the bladder was normally distended and contained just ten ounces of fluid. Microscopic examination shows that the fold in the male, as in the female, contains a considerable number of smooth muscular fibres, and that these are present even near the free edge of the mesial part where the two layers of peritoneum composing the fold are almost in apposition. This muscular tissue becomes continuous with that which is often present in considerable quantity surrounding the seminal vesicles and terminal portions of the vasa deferentia. When traced into the lateral part of the fold the muscular tissue seems to become connected with the tissue on the posterior aspect of the rectum and with that on the front of the sacrum. Here, however, it is difficult to make out definite connections. Numerous minute blood vessels running transversely can often be recognised by the unaided eye in this fold. These are probably the vessels which have been described in the female as establishing communications between the vessels of the rectum and those of the vagina and uterus. We have found these vessels present in the male even in the middle line and close to the free edge of the fold. Since there is so close an agreement in these structures

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in the two sexes, we consider that it is suitable to apply the same name in each case, and to speak of sacro-genital folds or folds of Douglas both in the male and in the female. The contained fibrous and muscular tissue will constitute in both sexes the sacro-genital ligaments and the recto-genital muscles respectively. In the specimens which we have examined it was not possible, however, to distinguish between these ligaments and muscles, but a continuous mass of mixed fibrous and smooth muscular tissue lay within the fold.

With regard to the relations presented by the round and broad ligaments of the uterus to the fossæ described in this paper we have merely the following notes to add:— The round ligament forms in the female the lower boundary of the obturator fossa, and separates it from the paravesical fossa. It is not by any means so intimately related to the ureter as the vas deferens is in the male. The round ligament leaves the side wall of the pelvis to enter the broad ligament when in its course it has reached the plane of the ureter, or sometimes even before it has passed so far backwards. In the latter case the obturator and paravesical fossæ are incompletely separated in their posterior parts. The attachment of the broad ligament to the pelvic wall descends almost vertically through the obturator and through the extreme posterior part of the paravesical fossa. In its lowest part the attachment of the ligament to the floor of the pelvis lies just over or immediately behind the terminal part of the ureter. The ovary lies in the posterior part of the obturator fossa, which is divided into anterior and posterior portions by the line of attachment of the broad ligament. We have nothing to add to Waldeyer's graphic and accurate descriptions of the fossa ovarica and of the relations which it presents to the ureter and other neighbouring structures.

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DESCRIPTION OF PLATES.

Plate I.

View of the pelvic cavity in the male. The body has been cut through the 3rd sacral vertebra in a plane which meets the horizontal at an angle of about 33°. On the right side a dark broken line indicates the position of the lower portion of the ilio-pectineal line—the inner boundary of the trigonum femorale.—A. B.

Plate II.

Mesial section of the male pelvis. The dark broken line indicates the position of the lower portion of the ilio-pectineal line—the inner boundary of the trigonum femorale.—A. F. D.

Plate III.

Mesial section of the female pelvis. Drawn from a model prepared from a dissection of Mr. Edward Taylor's. The dark broken line indicates the position of the lower portion of the ilio-pectineal line—the inner boundary of the trigonum femorale.—A. F. D.

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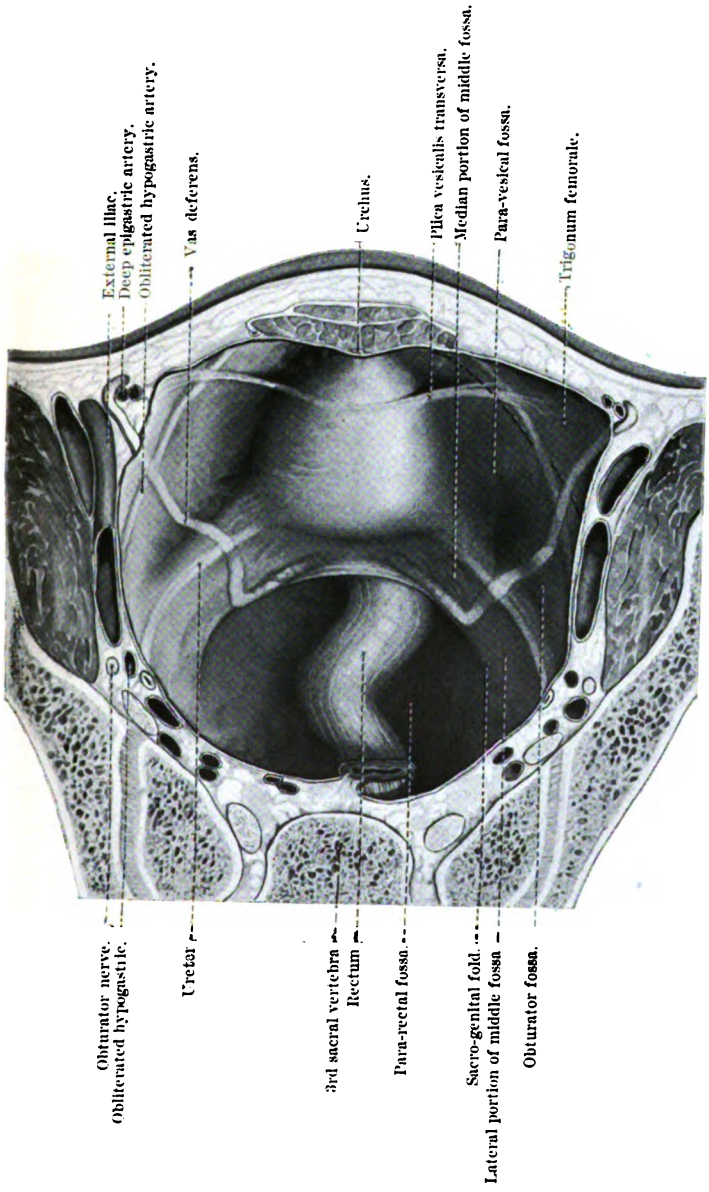
Drs. Birmingham and Dixon on the Peritoneum of the Pelvic Cavity.

PLATE I.



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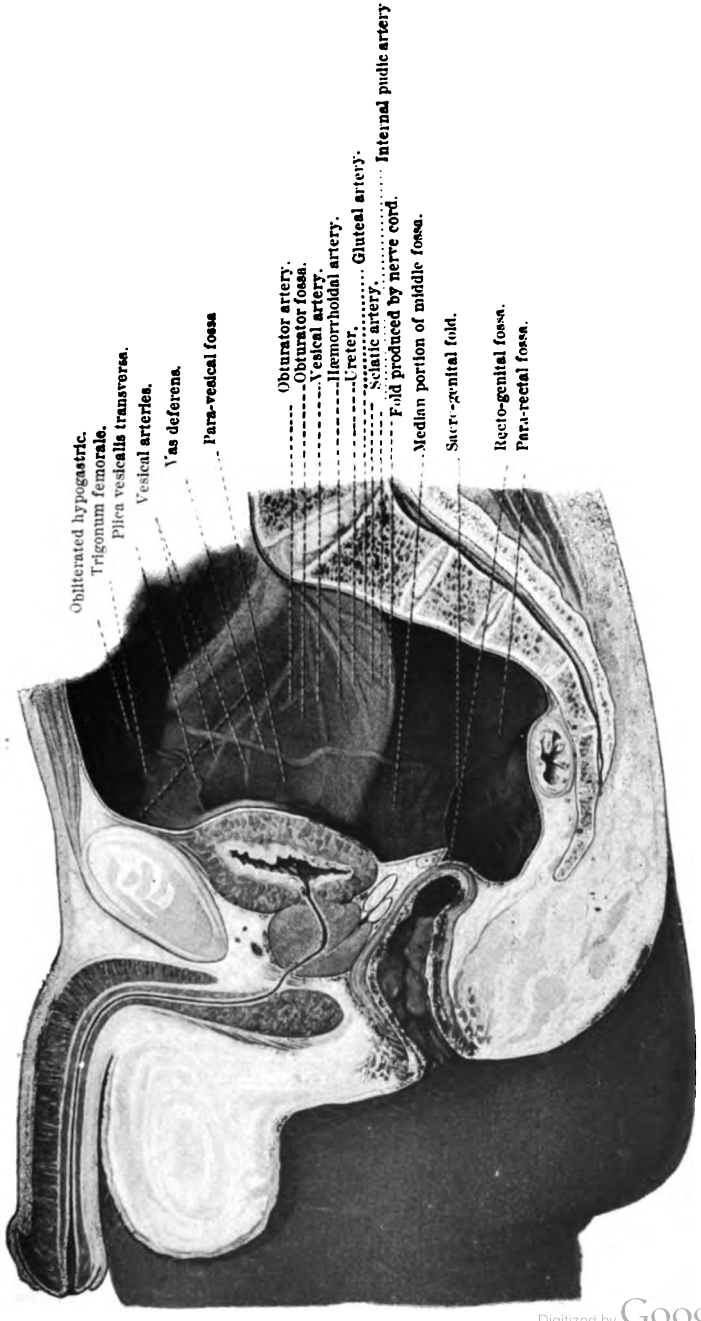
Drs. Birmingham and Dixon on the Peritoneum of the Pelvic Cavity.

PLATE. II.



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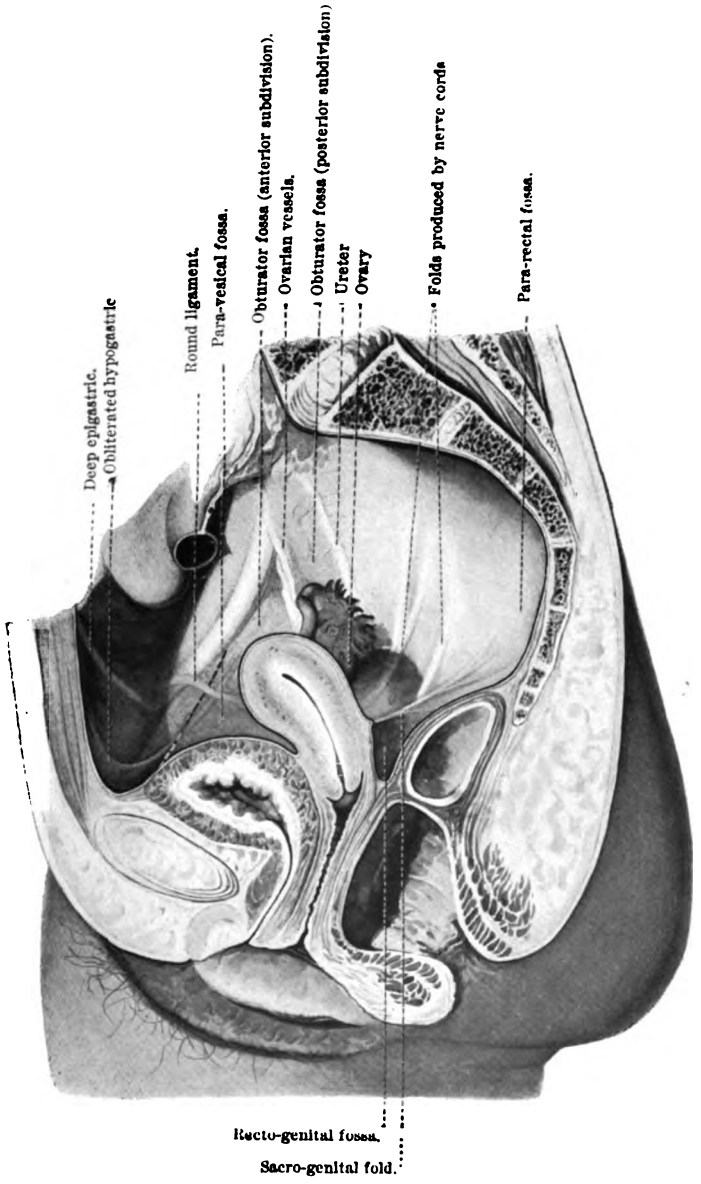
Drs. Birmingham and Dixon on the Peritoneum of the Pelvic Cavity.

PLATE III.



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SECTION OF SURGERY.

[*This Paper was unavoidably omitted from its proper position in the Section of Surgery.*]

NEPHRECTOMY FOR SARCOMATOUS TUMOUR OF KIDNEY.

By FRANCIS T. HEUSTON, M.D., F.R.C.S.;

Senior Surgeon to the Adelaide Hospital, Dublin; Consulting Surgeon to the Coombe Lying-in Hospital.

[Read in the Section of Surgery, November 9, 1900.]

In December, 1899, I was asked by my friend, Dr. W. J. Thompson, to see a young lady, aged twenty-four years. Her previous history was one of general good health, the only illness likely to have any bearing on her present affection being a severe attack of scarlatina at the age of eleven years, when she was unconscious for two or three days, but whether this had any renal origin could not be ascertained. About the age of twenty she became anæmic, for which she was treated at intervals; this had, however, disappeared to a great extent about three or four months since The patient dates the affection in her abdomen from the winter of 1898, when she noticed a small swelling in her right side, which was, and has been throughout, entirely painless; she, however, had attacks of diarrhœa recurring frequently and lasting about a day.

In February, 1899, about a year after the tumour was first noticed, she had a severe attack of hæmaturia, which lasted for two or three days and then subsided never to recur. In September of the same year the steadily increasing size and weight of the growth gave rise to a dragging pain in the side while she remained in the vertical position.

The patient when I saw her was a well-developed, well-nourished but slightly anæmic girl. Her heart sounds were normal. There

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was no evidence of either hypertrophy of the heart or increased arterial tension, and her respiratory and digestive systems presented no evidence of disease.

Inspection of the abdomen showed a large tumour occupying the right lumbar and umbilical regions; internally it extended to the linea alba, above it passed beneath the costal arch, and inferiorly it reached the level of the anterior superior iliac spine. The skin of the abdomen corresponding to the tumour had a normal appearance and moved freely over the growth, which, on bimanual examination, was found to move freely within the abdominal cavity, having apparently no attachment to the abdominal walls. This growth was of almost stony hardness, smooth and with well-defined edges; a dull percussion note existed over the whole of its anterior and external aspects; resonance was, however, to be obtained superiorly between it and hepatic dulness. When the patient lay on her left side the whole tumour fell towards that side, and a tympanitic percussion note could then be obtained in the right lumbar region, posterior and to the outer side of the tumour. Examination gave rise to no pain or tenderness.

The patient was kept under observation, when it was found she passed a very small quantity of urine, the quantity for the first seven days being ℥ 14, ℥ 22, ℥ 25, ℥ 20, ℥ 23, ℥ 24, and ℥ 20; this was pale in colour, had no deposit, was acid in reaction, 1026 to 1030 specific gravity, and had no albumen, sugar or tube casts. It was also noticed that there was a gradual increase in the size of the tumour, so its removal was determined on, and on February 1st, 1900, I proceeded to operate. When she was under the influence of the anæsthetic, and was turned on her left side, the tumour fell towards the middle line so as to occupy the entire umbilical region, from which, however, it could readily be displaced into the lumbar region, thus demonstrating its great mobility. The usual oblique incision for extra-peritoneal or posterior nephrectomy was made in the right loin, exposing a large, irregular mass, involving the kidney; it was at once evident that the growth was to a large extent cystic, and, to allow of its being removed through as small an incision as possible, some of the larger cysts were tapped by an aspirator needle, removing a large quantity of clear, watery fluid, and lessening the size of the tumour considerably. When the posterior aspect of the kidney was exposed its pelvis was found to be greatly thickened and enlarged, being

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evidently occupied by a firm growth; and on following the ureter downwards it proved to be occupied by an extension of this growth to where it passed over the brim of the true pelvis; here, however, the growth stopped abruptly in front of the iliac vessels, the ureter below this presenting normal characteristics. I now ligatured the ureter immediately below its affected portion, and dissected it and the pelvis upwards to the hilus of the kidney, separating the enlarged pelvis from the renal vessels, which I then ligatured with strong catgut, applied as a Staffordshire knot. On dividing the vessels the whole tumour came away without further trouble, the general peritoneal cavity not being opened into at any stage of the operation. A drainage tube was inserted into the cavity from which the tumour was removed, the muscles united by catgut sutures, and the superficial incision closed by silkworm gut.

The clear fluid removed from the cysts at the time of operation contained a small quantity of albumen, but no urea.

I need not detain you by the notes of the case subsequent to operation, as the wound healed by the first intention, and the patient returned home apparently perfectly well within six weeks, the only feature of interest being the almost immediate increase in the amount of urine passed, it now averaging ʒ 40 daily, as compared with an average of ʒ 21 before operation.

Professor Scott very kindly undertook the examination of the kidney, and furnishes the following report:—

"The kidney is very much enlarged and pear-shaped, with the narrow end upwards. The anterior surface is raised into little hillocks about one inch in diameter in half a dozen places, each one corresponding to a cyst in the substance of the kidney which raised up the wall. The kidney measures six and a half inches in the long diameter, and four inches wide at the broadest portion, and four inches from front to back at the same part. It weighed 20 oz. after it had been bisected, and the fluid consequently allowed to run out of some of the larger cysts.

"The section through the organ shows a number of cysts, the largest of which would about hold a sphere of two and a half inches in diameter; there are several about one inch, and a very great number about one quarter of an inch in diameter. Running round the convex border is a narrow band of tissue, in the

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greater part about one-eighth of an inch in thickness; at the thicker end of the kidney it measured one-sixteenth of an inch, and at the other, for a short distance, one-quarter of an inch. At one spot it presents a triangular section, the greatest thickness of which is five-eighths of an inch. This band of tissue, which forms a sort of capsule, is a little darker in colour, and proves, on microscopical examination, to be the cortex of the kidney. The Malpighian corpuscles and tubules are both present, but the latter are considerably altered, being dilated, and containing some material probably of an albuminous nature. In a few places there are cysts, but the largest of these does not exceed one-sixteenth of an inch in diameter. The remainder of the organ consists of a new growth, in which lie the large cysts before described. This growth filled the pelvis, and sent a long process, four inches long and about half an inch wide, down the ureter, which was dilated thereby, and lay close to the process, though not adherent to it. Other processes could be seen growing into former cysts, almost completely filling them up.

"Sections from several parts of the new growth were cut for microscopical examination. The general characters were similar, although slightly different appearances could be found in different fields. Some portions are very cellular, consisting mainly of elongated or spindle-shaped cells; in other portions the characters are those of fibrous tissue, and in a few places are patches of mucous tissue. In all a gradual transition from one form of tissue to another can be seen. The cysts are all lined by a single layer of epithelial cells; some of these are very small, being obviously dilated tubules, the larger ones probably being derived from the same source. The new growth apparently had its origin in the papillary portion of the kidney, and extended towards the pelvis, surrounding in its growth some of the tubules; these in some cases became dilated into cysts, and these again became filled by the new growth pressing into them from the side, thus forming papillary masses, covered on the outside by epithelium."

This case presents many points in its pathological and histological characters which render it difficult to place it under any one of the many cystic and solid growths known to affect the kidney. It evidently was a solid

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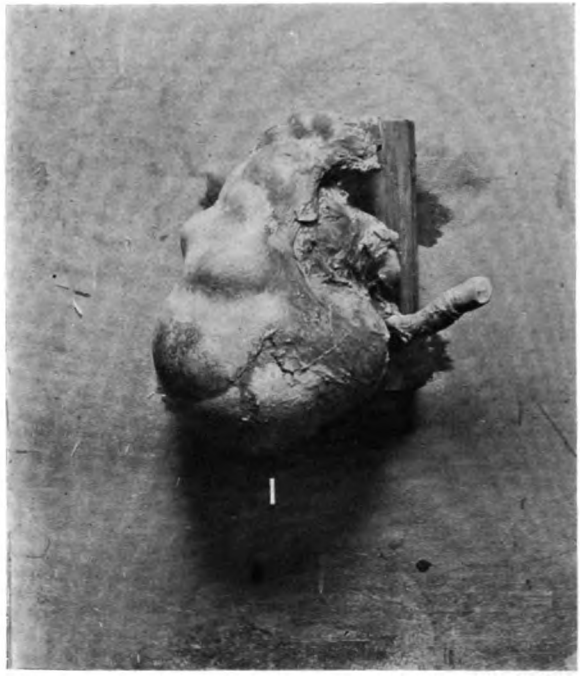

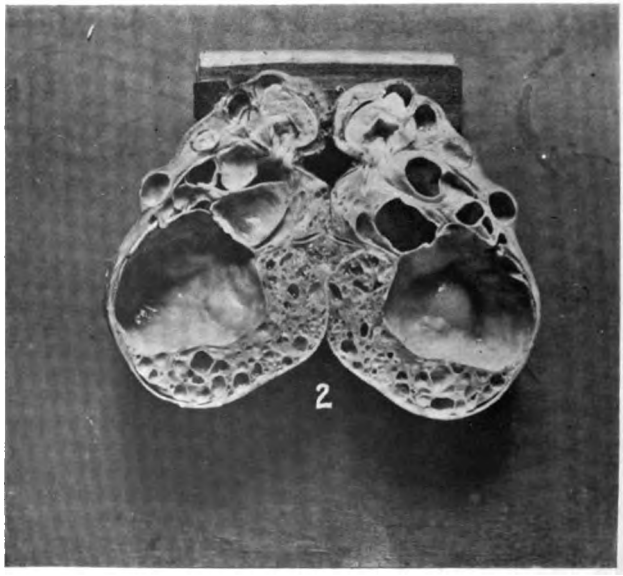

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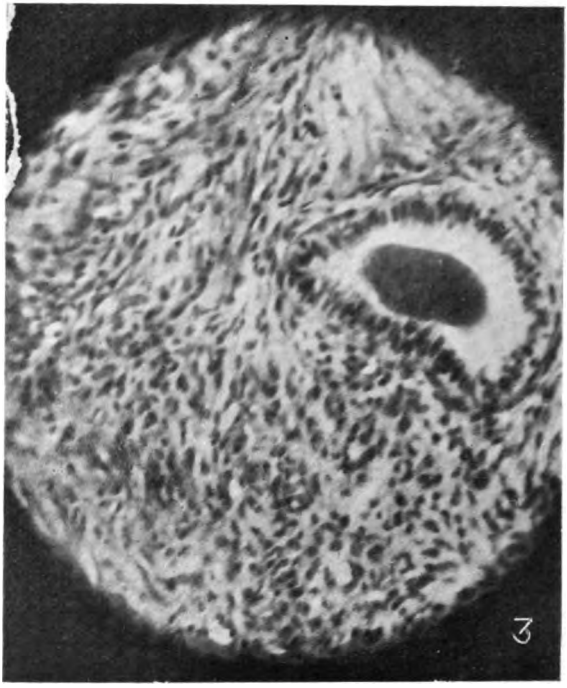

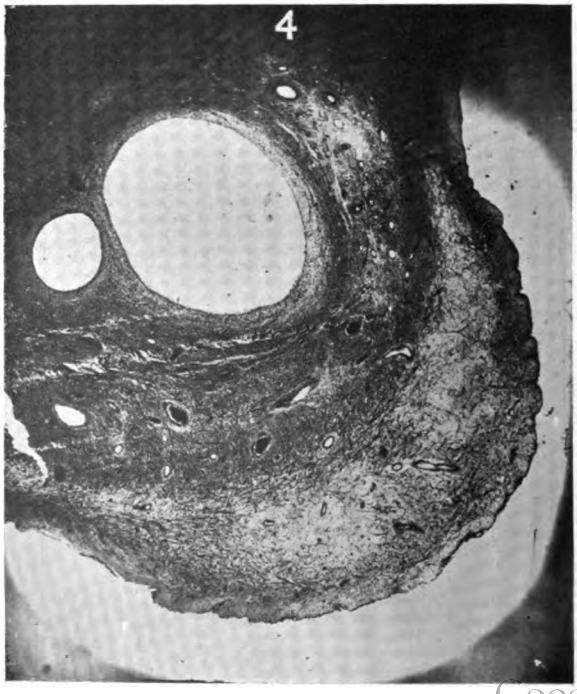

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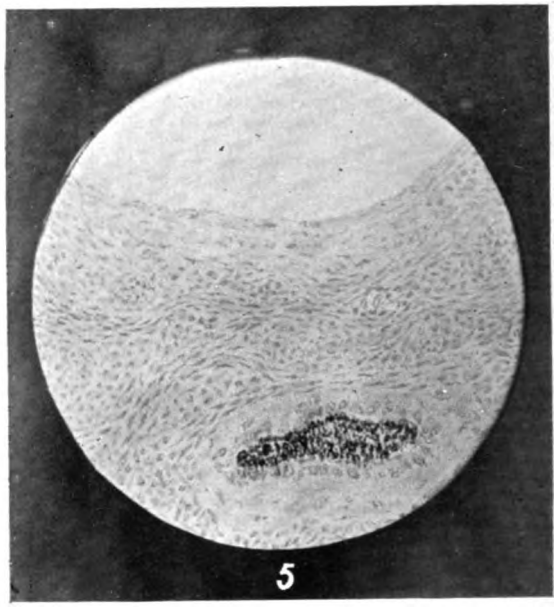

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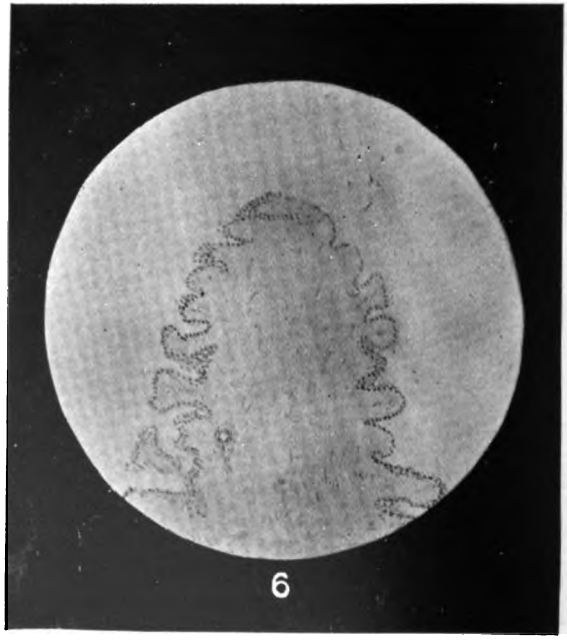

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growth primarily, with secondary cystic development. This primary growth had its origin in the papillary portion of the kidney, and showed a tendency to grow in the first instance into the pelvis and ureter, subsequently involving the cysts which had formed in the meanwhile. Taking this into consideration with the clinical history, I believe it to be a case of sarcoma occurring in adult life, as although sarcoma usually occurs in early childhood, and is then a round-celled growth, that which occurs in adult life is usually of the spindle-celled variety.

October, 1901.—I received a letter within the past fortnight from my patient, stating she enjoyed perfect health since the operation.

EXPLANATION OF FIGURES.

Fig. I.—Photograph of kidney from the front, showing the hillocks corresponding to cysts, and the long papilla which extended into the ureter.

Fig. II.—Section through centre of kidney cut longitudinally, showing the thin layer of cortex forming a capsule, with the cystic new growth filling and dilating the pelvis.

Fig. III.—Photo-micrograph (x 300) of cellular portion with small tubercle in growth.

Fig. IV.—Photo-micrograph (x 20) of a papilla extending into a cyst. It contains two small cysts lined by cubical epithelium; round these, fibrous tissue with blood-vessels; nearer the margin a more transparent portion of mucous tissue and a single layer of cubical epithelium on the outside.

Fig. V.—Micro-photograph of kidney (x ·200). Wall of large cyst in kidney, showing cellular structure; small blood-vessel below.

Fig. VI.—Micro-photograph (x ·80). End of growth down ureter, showing numerous small papillæ covered with large cells.

Mr. T. Myles asked if there was any theory to explain the increase in the quantity of urine after the operation? Assuming, even, that the removed kidney had done nothing, it was still hard to conceive why its fellow should start doing increased work after operation. With reference to the *technique* of the operation, in ligaturing the renal vessels did he apply a clamp to the vessels, or

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simply ligature them *en bloc* without clamping? What material had he used as ligature, and, if silk, did it give him any trouble?

MR. JAMESON JOHNSTON referred to the route adopted. Although this route proved eminently successful, still they would imagine the anterior route to be the natural one.

MR. CROLY said that the first time he excised a kidney was by an abdominal incision. The case was that of a lady who had a large cystic growth presenting in the abdomen, and she was passing large quantities of urine and pus. They found a large stone impacted in the upper part of the kidney, and an interesting point was that when tying the ureter and renal vein they could not find the renal artery. The only conclusion he could come to was that it had been completely obliterated. The patient did not recover from the shock, and she did not secrete one drop of urine after operation. On examining the other kidney he found a large stone impacted there also, and no secreting portion of the kidney left. It was hard to determine which kidney was in the worse condition.

MR. HEUSTON, in reply, said an increase in the quantity of urine was a well-known phenomenon after operation in cases where one kidney was diseased and functionally inactive for a long time, and the other kidney, being in a healthy condition, had had to do all the work. Whether that was due to the source of irritation being removed or to nervous reflex action had not yet, as far as he knew, been decided. With regard to the ligaturing of the renal vessels, he had applied the ligature without any primary clamping or interference with the vessels, and that, he added, was a procedure he was in the habit of adopting. Of course, one would be most inclined to apply a clamp in the case of the right kidney on account of the proximity of the inferior vena cava, but he had never seen trouble from secondary hæmorrhage owing to the non-use of a clamp, and he, therefore, did not employ it. He employed catgut ligatures, not silk, as he had a strong objection to applying silk ligatures in these cases. In a recent case, where he removed a kidney for extensive degeneration due to stone, he departed from this rule, and applied silk, thinking he was too strongly biased against its use. The wound healed up perfectly, with the exception of a small sinus which went on giving trouble. He had operated on that case in August, and it was only within the past fortnight that the lady sent up a ligature in a box to him, saying it was washed out in cleaning the sinus. This was the silk

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ligature which he had put round the renal vessels, and he, therefore, advocated strong catgut, which did all that was required. With reference to his adoption of the posterior route instead of the anterior incision, he found that in the latter operation it was always necessary subsequently to make a drainage opening posteriorly, as they could not leave the large space from which the kidney had been removed without drainage. For that reason, and also owing to the great liability of gangrene of the ascending colon occurring after the anterior operation, he never did an anterior operation now. Moreover, the anterior operation *per se*, without reference to complications, was 19 to 20 per cent. more fatal than the posterior method. It would want to be a very large tumour, indeed, for which there would not be room in the posterior incision, because they could continue the incision forward until they came to the edge of the rectus muscle, separating the peritoneum at the same time.

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